

## ***Module 4: Treatment of Latent Tuberculosis Infection and Tuberculosis Disease***

### **Facilitation Tips**

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#### **Purpose:**

In this module, participants will learn about the principles of treating latent tuberculosis infection (LTBI) and TB disease. A person with LTBI is treated to prevent them from progressing to TB disease. Some people with LTBI are at very high risk of developing TB disease, and they should receive high priority for LTBI treatment. TB disease is treated to cure the patient and to stop the spread of TB. As health care workers, participants may be responsible for helping TB patients take their medications as prescribed. This is very important because patients with TB disease who do not complete treatment as prescribed may become infectious or develop drug-resistant TB; patients with LTBI who do not complete treatment as prescribed can unnecessarily develop TB disease.

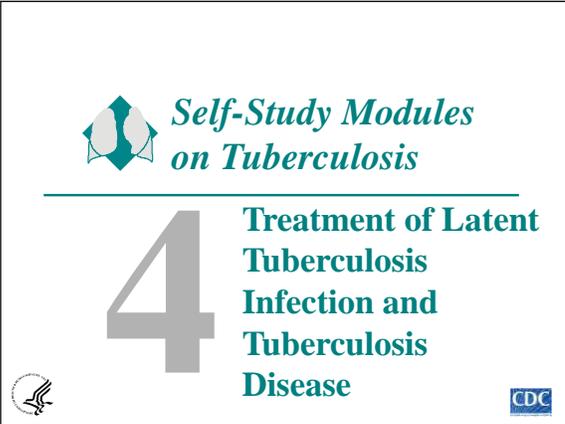
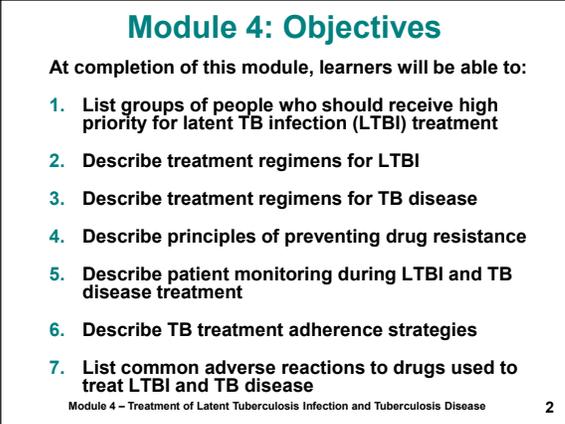
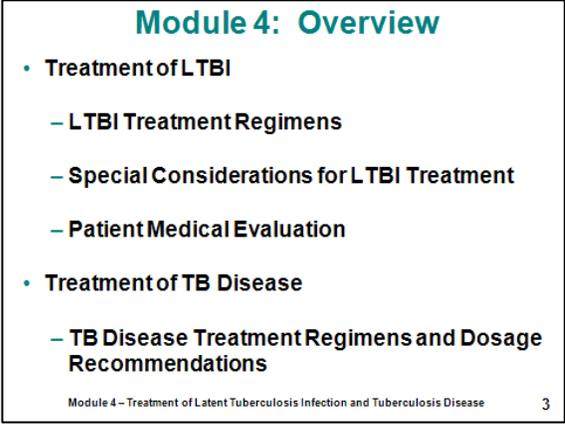
#### **Learning Objectives:**

After this presentation, participants will be able to

1. List the groups of people who should receive high priority for LTBI treatment
2. Describe treatment regimens for LTBI
3. Describe treatment regimens for TB disease
4. Describe the principles of preventing drug resistance
5. Describe patient monitoring during LTBI and TB disease treatment
6. Describe TB treatment adherence strategies
7. List the common adverse reactions to the drugs used to treat LTBI and TB disease

#### **Module Overview**

<b>Time</b>	<b>Activity</b>	<b>Content</b>	<b>Slides</b>
5 min.	Presentation	Introduction	Slides 1-4
35 min.	Presentation	Treatment of LTBI	Slides 5-63
40 min.	Presentation	Treatment of TB Disease	Slides 64-136
10 min.	Case Studies	Case Studies	Slides 137-153
<b>90 min.</b>	<b>Total Time</b>		

		<b>Facilitation Tips</b>
<b>Slide 1</b>		<ul style="list-style-type: none"> <li>- Introduce Module 4</li> </ul>
<b>Slide 2</b>		<ul style="list-style-type: none"> <li>- State objectives of presentation</li> </ul> <p><i>Background and Objectives - Module 4, p. 1</i></p>
<b>Slide 3</b>		<ul style="list-style-type: none"> <li>- Review slide content</li> </ul>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 4</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Overview (cont.)</b></p> <ul style="list-style-type: none"> <li>• <b>Treatment of TB Disease (cont.)</b> <ul style="list-style-type: none"> <li>– <b>Special Considerations and Alternative Treatment Regimens</b></li> <li>– <b>Treatment Monitoring Plan and Adverse Reactions</b></li> <li>– <b>Adherence and Evaluating Patients' Response to Treatment</b></li> </ul> </li> <li>• <b>Case Studies</b></li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">4</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 5</b></p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p style="font-size: 24px; color: #008080;"><b>Treatment of LTBI</b></p> <hr style="width: 30%; margin: 10px auto;"/> <p style="font-size: small; margin-top: 20px;">5</p> </div>	<ul style="list-style-type: none"> <li>- Introduce section</li> <li>- Ask who should be treated for LTBI</li> <li>- Ask why people with LTBI should be treated</li> </ul> <p style="text-align: right; font-style: italic; margin-top: 20px;"><i>Treatment of LTBI - Module 4, pp. 4-20</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 6</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Treatment of LTBI (1)</b></p> <ul style="list-style-type: none"> <li>• <b>LTBI is treated to prevent the development of TB disease</b></li> <li>• <b>LTBI is treated with medication</b></li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">6</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; font-style: italic; margin-top: 20px;"><i>Treatment of LTBI - Module 4, p. 4</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 7</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Treatment of LTBI (2)</b></p> <ul style="list-style-type: none"> <li>• Targeted testing should be used to identify and treat persons: <ul style="list-style-type: none"> <li>– At high risk for infection with <i>M. tuberculosis</i></li> <li>– At high risk for developing TB disease once infected with <i>M. tuberculosis</i></li> </ul> </li> <li>• People in these groups should receive high priority for LTBI treatment if they have a positive tuberculin skin test (TST) or interferon-gamma release assay (IGRA)</li> </ul> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 7</p> </div>	<ul style="list-style-type: none"> <li>- Explain that some groups are at higher risk for TB than others</li> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Treatment of LTBI - Module 4, p. 4</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 8</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>High Priority for LTBI Treatment (1)</b></p> <ul style="list-style-type: none"> <li>• High-priority groups for LTBI treatment if positive IGRA or TST result of <math>\geq 5</math> mm <ul style="list-style-type: none"> <li>– Recent close contacts of people with infectious TB disease</li> <li>– People living with HIV</li> <li>– People with chest x-ray findings suggestive of previous TB disease</li> <li>– Patients with organ transplants</li> <li>– Other immunosuppressed patients</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 8</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>High Priority for LTBI Treatment - Module 4, p. 5</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 9</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>High Priority for LTBI Treatment (2)</b></p> <ul style="list-style-type: none"> <li>• High-priority groups for LTBI treatment if positive IGRA or TST result of <math>\geq 10</math> mm: <ul style="list-style-type: none"> <li>– People who have come to U.S. within last 5 years from countries where TB is common</li> <li>– People who inject drugs</li> <li>– People who live or work in high-risk facilities</li> <li>– People who work in mycobacteriology laboratories</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 9</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>High Priority for LTBI Treatment - Module 4, p. 5</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 10</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="margin: 0;">High Priority for LTBI Treatment (3)</h3> <ul style="list-style-type: none"> <li>• High-priority groups for LTBI treatment if positive IGRA or TST result of <math>\geq 10</math> mm: (cont.): <ul style="list-style-type: none"> <li>– People with medical conditions that increase risk of TB disease</li> <li>– Children younger than 4 years old</li> <li>– Infants, children, and adolescents exposed to adults in high-risk groups</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 10</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>High Priority for LTBI Treatment - Module 4, p. 5</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 11</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="margin: 0;">Low Priority for LTBI Treatment</h3> <ul style="list-style-type: none"> <li>• Individuals without any risk factors generally should not be tested for TB infection</li> <li>• However, individuals with no risk factors who are tested and have a positive IGRA or TST result of <math>\geq 15</math> mm should be evaluated for LTBI treatment</li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 11</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Low Priority for LTBI Treatment - Module 4, p. 6</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 12</b></p>	<div style="border: 1px solid black; padding: 10px;"> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;"> <h3 style="margin: 0;">Treatment of LTBI Study Question 4.1</h3> </div> <p style="margin: 0;"><b>What is the purpose of LTBI treatment?</b> (pg. 7)</p> <p style="margin: 10px 0 0 20px; color: teal;">To prevent people with latent TB infection from developing TB disease.</p> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 12</p> </div>	<ul style="list-style-type: none"> <li>- Introduce study questions</li> <li>- Ask participants to turn to p. 7 (if participants have print-based modules)</li> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Answers – Module 4, p. 52</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 13</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Treatment of LTBI Study Question 4.2</b></p> <p><b>Which groups of people should receive high-priority for LTBI treatment if they have a positive IGRA or TST result of <math>\geq 5</math> mm? Name 5. (pg. 7)</b></p> <ul style="list-style-type: none"> <li>• People living with HIV infection</li> <li>• Recent close contacts of people with infectious TB disease</li> <li>• People with chest x-ray findings suggestive of previous TB disease</li> <li>• Patients with organ transplants</li> <li>• Other immunosuppressed patients</li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">13</span></p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 52</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 14</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Treatment of LTBI Study Question 4.3</b></p> <p><b>Which groups of people should receive high priority for LTBI treatment if they have a positive IGRA or TST result of <math>\geq 10</math> mm? Name 7. (pg. 7)</b></p> <ul style="list-style-type: none"> <li>• People who come to U.S. within last 5 years from areas of the world where TB is common</li> <li>• People who inject drugs</li> <li>• People who live or work in high-risk facilities</li> <li>• People who work in mycobacteriology laboratories</li> <li>• People with medical conditions that increase risk of TB disease</li> <li>• Children younger than 4 years old</li> <li>• Infants, children, and adolescents exposed to adults in high-risk groups</li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">14</span></p> </div>	<ul style="list-style-type: none"> <li>- Ask for a volunteer to read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 52</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 15</b></p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p><b>Treatment of Latent TB Infection (LTBI)</b></p> <hr style="width: 30%; margin: auto;"/> <p><b>LTBI Treatment Regimens</b></p> <p style="font-size: small; margin-top: 20px;">15</p> </div>	<ul style="list-style-type: none"> <li>- Introduce Section</li> </ul>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 16</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>LTBI Treatment Regimens (1)</b> Isoniazid</p> <ul style="list-style-type: none"> <li>• Preferred regimen is isoniazid (INH) daily for 9 months</li> <li>• INH may also be given for 6 months <ul style="list-style-type: none"> <li>– Cost effective and patients may find it easier to adhere, <b>BUT:</b> <ul style="list-style-type: none"> <li>• Not as effective if given for less than 6 months</li> <li>• Not recommended for people living with HIV, individuals with previous TB disease, or children</li> </ul> </li> </ul> </li> </ul> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">16</span></p> </div>	<ul style="list-style-type: none"> <li>- Explain that there are several treatment regimens available for LTBI; however, the preferred treatment is INH for 9 months</li> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>LTBI Treatment Regimens – Module 4, p. 8</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 17</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>LTBI Treatment Regimens (2)</b> Rifampin</p> <ul style="list-style-type: none"> <li>• Rifampin (RIF) is recommended for people who: <ul style="list-style-type: none"> <li>– Cannot tolerate INH</li> <li>– Have been exposed to INH-resistant TB</li> </ul> </li> <li>• RIF should be given daily for 4 months</li> <li>• RIF should not be used with certain combinations of anti-retroviral (ARV) therapy</li> <li>• In some cases, rifabutin may be substituted when RIF cannot be used</li> </ul> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">17</span></p> </div>	<ul style="list-style-type: none"> <li>- Explain that in some situations, drugs other than INH may be used for LTBI treatment</li> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>LTBI Treatment Regimens – Module 4, p. 8</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 18</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>LTBI Treatment Regimens (3)</b> Rifampin and Pyrazinamide</p> <ul style="list-style-type: none"> <li>• CDC advises <u>against</u> using a combination of RIF and pyrazinamide (PZA) for 2 months for people with or without HIV infection due to serious side effects: <ul style="list-style-type: none"> <li>– Severe liver injury</li> <li>– Death</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">18</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>LTBI Treatment Regimens – Module 4, p. 9</i></p>

Slide 19

### LTBI Treatment Regimens (4)

Drug	Duration (months)	Interval	Minimum Dose	Comments
INH	9	Daily	270	<ol style="list-style-type: none"> <li>Daily treatment for 9 months</li> <li>Recommended for people living with HIV, children, and people with chest x-rays suggestive of previous TB disease</li> <li>Twice-weekly dosing should use DOT</li> </ol>
		Twice weekly	76	
INH	6	Daily	180	<ol style="list-style-type: none"> <li>NOT recommended for people living with HIV, children, or people with chest x-rays suggestive of previous TB disease</li> <li>Twice-weekly dosing should use DOT</li> </ol>
		Twice weekly	52	

Table 4.2 Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 19

- Ask participants to turn to p. 9 (if participants have print-based modules)
- Explain that this table describes the various LTBI treatment regimens
- Review slide content

*LTBI Treatment Regimens – Module 4, p. 9*

Slide 20

### LTBI Treatment Regimens (5)

Drug	Duration (months)	Interval	Minimum Dose	Comments
RIF	4	Daily	120	<ol style="list-style-type: none"> <li>Recommended for INH-resistant TB</li> <li>Alternative for people who cannot tolerate INH</li> <li>NOT recommended for HIV-infected patients on certain combinations of ARV therapy. Rifabutin may be used instead for some patients.</li> </ol>
RIF/PZA	RIF and PZA combinations generally should not be offered for treatment of LTBI			

Table 4.2 Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 20

- Review slide content

*LTBI Treatment Regimens – Module 4, p. 9*

Slide 21

### LTBI Treatment Regimens Study Question 4.4

**What is the preferred LTBI treatment regimen?** (pg.10)

**INH given daily for 9 months.**

Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 21

- Introduce study questions
- Ask participants to turn to p. 10 (if participants have print-based modules)
- Read question
- Ask participants for answers

*Answers – Module 4, p. 52*

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 22</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>LTBI Treatment Regimens Study Question 4.5</b></p> <p>What LTBI treatment regimen may be recommended for people with a positive IGRA or a TST result who have been exposed to INH-resistant TB? <i>(pg. 10)</i></p> <p style="text-align: center; color: teal;">Treatment with rifampin for 4 months may be recommended in this situation.</p> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">22</span></p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 53</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 23</b></p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p><b>Treatment of Latent TB Infection (LTBI)</b></p> <hr style="width: 50%; margin: auto;"/> <p><b>Special Considerations for LTBI</b></p> <p style="font-size: small; margin-top: 20px;">23</p> </div>	<ul style="list-style-type: none"> <li>- Introduce section</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 24</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p><b>Special Considerations for LTBI (1)</b> Directly Observed Therapy (DOT)</p> <ul style="list-style-type: none"> <li>• DOT is when a health care worker (HCW) or another designated person watches a patient swallow each dose of medication <ul style="list-style-type: none"> <li>– Used to help patients adhere to treatment</li> <li>– Should be considered for people who are at high risk for TB or suspected to be non-adherent</li> <li>– Recommended for intermittent therapy</li> </ul> </li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">24</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that intermittent therapy is when regimens are given once or twice weekly</li> </ul> <p style="text-align: right;"><i>Directly Observed Therapy – Module 4, p. 11</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Slide 25</p>	<div style="border: 1px solid black; padding: 10px;"> <p><b>Special Considerations for LTBI (2)</b>  <b>Close Contacts</b></p> <ul style="list-style-type: none"> <li>• Close contacts are people who have had recent and prolonged exposure to a person with known or suspected infectious TB</li> <li>• Close contacts should be evaluated for LTBI and TB disease <ul style="list-style-type: none"> <li>– If TST or IGRA result is positive, contacts should be given high priority for LTBI treatment</li> <li>– If TST or IGRA result is negative, contacts should be retested in 8-10 weeks</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 25</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that contacts should be retested after 8-10 weeks if their result is negative because sometimes it can take 2-8 weeks after TB infection for the body’s immune system to produce a response to the TST or IGRA</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Close Contacts – Module 4, p. 11</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Slide 26</p>	<div style="border: 1px solid black; padding: 10px;"> <p><b>Special Considerations for LTBI (3)</b>  <b>Close Contacts at High Risk for TB Disease</b></p> <ul style="list-style-type: none"> <li>• Some close contacts at high risk to progress to TB disease may start LTBI treatment even if test result is negative, but <u>less than 8-10 weeks</u> have passed since exposure to TB: <ul style="list-style-type: none"> <li>– Children younger than 5 years old</li> <li>– People living with HIV</li> <li>– Other immunocompromised persons</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 26</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that it is possible that some contacts are infected with <i>M. tuberculosis</i> but have a false-negative TST reaction because less than 8-10 weeks have passed since they were last exposed to TB</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Close Contacts at High Risk for TB Disease – Module 4, p. 11</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Slide 27</p>	<div style="border: 1px solid black; padding: 10px;"> <p><b>Special Considerations for LTBI (4)</b>  <b>Close Contacts at High Risk for TB Disease</b></p> <ul style="list-style-type: none"> <li>• Once active TB disease is ruled out, close contacts at high risk for TB disease should: <ul style="list-style-type: none"> <li>– Start LTBI treatment</li> <li>– Be retested 8-10 weeks after last exposure <ul style="list-style-type: none"> <li>• If negative test result: stop LTBI treatment</li> <li>• If positive test result: continue treatment</li> </ul> </li> </ul> </li> <li>• Contacts with weakened immune systems may be given full course of LTBI treatment <u>regardless</u> of second TST or IGRA test result</li> </ul> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 27</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that LTBI treatment is started to prevent persons from rapidly progressing to TB disease</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Close Contacts at High Risk for TB Disease – Module 4, p. 12</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 28</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p><b>Special Considerations for LTBI (5)</b> Close Contacts</p> <ul style="list-style-type: none"> <li>• In general, contacts with positive test result and a <u>documented history</u> of completion of LTBI treatment do not need to be retreated</li> <li>• However, retreatment may be necessary for persons at high risk of: <ul style="list-style-type: none"> <li>– Becoming re-infected</li> <li>– Progressing to TB disease</li> </ul> </li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 28</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right;"><i>Close Contacts – Module 4, p. 12</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 29</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p><b>Special Considerations for LTBI (6)</b> Contacts of INH-Resistant TB</p> <ul style="list-style-type: none"> <li>• Contacts of patients with INH-resistant but RIF-susceptible TB should be treated with a 4-month daily regimen of RIF</li> <li>• In some patients rifabutin may be substituted if RIF cannot be used</li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 29</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right;"><i>Contacts of INH-Resistant TB – Module 4, p. 12</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 30</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p><b>Special Considerations for LTBI (7)</b> Contacts of Multidrug-Resistant TB (MDR TB)</p> <ul style="list-style-type: none"> <li>• Contacts of patients with MDR TB <ul style="list-style-type: none"> <li>– May be treated for 6-12 months with an alternative regimen of drugs to which organism is susceptible</li> </ul> <p style="text-align: center;">OR</p> <li>– Can be observed for signs and symptoms of TB disease for 2 years without treatment</li> </li></ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 30</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right;"><i>Contacts of Multidrug-Resistant TB – Module 4, p. 12</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 31</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Special Considerations for LTBI (8)</b> Contacts of MDR TB</p> <ul style="list-style-type: none"> <li>• Risk of developing TB disease should be considered before recommending LTBI treatment</li> <li>• MDR TB treatment expert should be consulted</li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">31</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Contacts of MDR TB – Module 4, p. 12</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 32</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Special Considerations for LTBI (9)</b> Infants and Children</p> <ul style="list-style-type: none"> <li>• Infants and children are more likely to develop life-threatening forms of TB disease</li> <li>• Children younger than 5 years old who have been exposed to TB should start taking LTBI treatment even if they have a negative TST result because they: <ul style="list-style-type: none"> <li>– Are at high risk for rapidly developing TB disease</li> <li>– May have a false-negative TST reaction</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">32</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Ask why infants and children are more likely to develop life threatening forms of TB disease</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Infants and Children – Module 4, p. 13</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 33</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Special Considerations for LTBI (10)</b> Infants and Children</p> <ul style="list-style-type: none"> <li>• Infants and children should be retested 8-10 weeks after last exposure</li> <li>• LBTI treatment can be stopped if ALL of the following conditions are met: <ul style="list-style-type: none"> <li>– Second TST is negative</li> <li>– Second TST was done 8-10 weeks after child was last exposed to TB</li> <li>– Child is at least 6 months old</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">33</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Infants and Children – Module 4, p. 13</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Slide 34</p>	<div style="border: 1px solid black; padding: 10px;"> <p><b>Special Considerations for LTBI (11)</b>  <b>Pregnant Women</b></p> <ul style="list-style-type: none"> <li>• For most pregnant women, LTBI treatment can be delayed until after delivery, unless they have certain medical conditions <ul style="list-style-type: none"> <li>– INH has <u>not</u> been shown to have harmful effects on the fetus</li> </ul> </li> <li>• Immediate treatment should be considered if woman is living with HIV, has another immunocompromising condition, or is a recent TB contact</li> <li>• Preferred LTBI treatment regimen is 9 months of INH with a vitamin B6 supplement</li> </ul> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 34</p> </div>	<p>- Review slide content</p> <p style="text-align: right; margin-top: 100px;"><i>Pregnant Women – Module 4, p. 14</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Slide 35</p>	<div style="border: 1px solid black; padding: 10px;"> <p><b>Special Considerations for LTBI (12)</b>  <b>Breastfeeding Women</b></p> <ul style="list-style-type: none"> <li>• Women who are breastfeeding can take INH but should also be given a vitamin B6 supplement</li> <li>• Amount of INH in breast milk is not enough to be considered treatment for infant</li> </ul> <div style="text-align: center; margin: 10px 0;">  </div> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 35</p> </div>	<p>- Review slide content</p> <p style="text-align: right; margin-top: 100px;"><i>Breastfeeding Women – Module 4, p. 14</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Slide 36</p>	<div style="border: 1px solid black; padding: 10px;"> <p><b>Special Considerations for LTBI (13)</b>  <b>People Living with HIV</b></p> <ul style="list-style-type: none"> <li>• Individuals living with HIV should be treated with 9-month regimen of INH</li> <li>• RIF <u>should not</u> be used for people living with HIV who are being treated with certain combinations of ARV <ul style="list-style-type: none"> <li>– In some cases, rifabutin may be given</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 36</p> </div>	<p>- Review slide content</p> <p style="text-align: right; margin-top: 100px;"><i>People Living with HIV – Module 4, p. 14</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 37</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Special Considerations for LTBI Study Question 4.6</b></p> <p><b>In what circumstances may LTBI treatment be given to people who have a negative TST or IGRA result?</b> (pg. 15)</p> <p>Some close contacts may start LTBI treatment if they have a negative test but less than 8-10 weeks have passed since last exposed to TB; these contacts include:</p> <ul style="list-style-type: none"> <li>• Children who are younger than 5 years old</li> <li>• People living with HIV</li> <li>• Other immunocompromised persons</li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 37</p> </div>	<ul style="list-style-type: none"> <li>- Introduce study questions</li> <li>- Ask participants to turn to p. 15 (if participants have print-based modules)</li> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 53</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 38</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Special Considerations for LTBI Study Question 4.7</b></p> <p><b>What conditions must be met to stop LTBI treatment for children younger than 5 years old who are exposed to TB?</b> (pg. 15)</p> <ul style="list-style-type: none"> <li>• LTBI treatment can be stopped if ALL the following conditions are met: <ul style="list-style-type: none"> <li>– Second skin test is negative</li> <li>– Second skin test was done 8-10 weeks after the child was last exposed to TB</li> <li>– Child is at least 6 months old</li> </ul> </li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 38</p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 53</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 39</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Special Considerations for LTBI Study Question 4.8</b></p> <p><b>When should pregnant women be treated for LTBI and for how long?</b> (pg. 15)</p> <ul style="list-style-type: none"> <li>• For most pregnant women with TB infection, LTBI treatment can be delayed until after delivery. If the pregnant woman is HIV-infected or a recent contact, immediate treatment should be considered.</li> <li>• Preferred treatment regimen for pregnant women is 9 months of INH with a vitamin B6 supplement.</li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 39</p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 53</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 40</b></p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <h2>Treatment of Latent TB Infection (LTBI)</h2> <hr/> <h3>Patient Medical Evaluation</h3> <p style="font-size: small;">40</p> </div>	<ul style="list-style-type: none"> <li>- Introduce section</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 41</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3>Patient Medical Evaluation (1)</h3> <p>Medical evaluations should be done in order to:</p> <ol style="list-style-type: none"> <li>1. Exclude possibility of TB disease</li> <li>2. Determine whether patient has ever been treated for LTBI or TB disease</li> <li>3. Find out if patient has any medical conditions that may complicate therapy</li> <li>4. Establish and build rapport with patient</li> </ol> <p style="font-size: x-small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 41</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; font-style: italic;">Patient Medical Evaluation – Module 4, p.17</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 42</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3>Patient Medical Evaluation (2)</h3> <ol style="list-style-type: none"> <li>1. Exclude possibility of TB disease <ul style="list-style-type: none"> <li>• Treating TB disease with LTBI treatment regimen can lead to drug resistance</li> <li>• Patients should be evaluated with chest x-ray</li> <li>• Patients with symptoms or chest x-ray findings of TB disease should be given TB disease treatment, not LTBI treatment</li> </ul> </li> </ol> <p style="font-size: x-small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 42</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that treating TB disease with an LTBI treatment regimen can lead to drug resistance since LTBI is usually only treated with a single drug</li> </ul> <p style="text-align: right; font-style: italic;">Patient Medical Evaluation – Module 4, p.17</p>

Slide 43	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Patient Medical Evaluation (3)</b></p> <p><b>2. Determine whether patient has ever been treated for LTBI or TB disease</b></p> <ul style="list-style-type: none"> <li>• Patients who have been adequately treated should not be treated again</li> <li>• TST or IGRA results cannot determine if patient has received treatment for LTBI or TB disease; or if they have been re-infected after treatment</li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">43</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that people who have a positive TST reaction will have another positive reaction if they are skin tested later in their lives, regardless of whether they have received treatment</li> <li>- Note that there is not enough data on the ability of IGRAs to detect re-infection after treatment for both LTBI and TB disease</li> </ul> <p style="text-align: right; margin-top: 10px;"><i>Patient Medical Evaluation – Module 4, p.17</i></p>
Slide 44	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Patient Medical Evaluation (4)</b></p> <p><b>3. Find out if patient has any medical conditions that may complicate therapy. These patients include:</b></p> <ul style="list-style-type: none"> <li>• People living with HIV</li> <li>• People with history of liver disorder or disease</li> <li>• People who use alcohol regularly</li> <li>• Women who are pregnant or just had a baby (within 3 months of delivery)</li> <li>• People who are taking other medications that may increase the risk of hepatitis</li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">44</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 10px;"><i>Patient Medical Evaluation – Module 4, p.17</i></p>
Slide 45	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Patient Medical Evaluation (5)</b></p> <ul style="list-style-type: none"> <li>• For patients with the medical conditions listed on the previous slide, baseline laboratory liver function tests (to detect injury to liver) are recommended before starting LTBI treatment</li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">45</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 10px;"><i>Patient Medical Evaluation – Module 4, p.17</i></p>

Slide 46	<div data-bbox="269 268 833 688" style="border: 1px solid black; padding: 10px;"> <h3 style="text-align: center;">Patient Medical Evaluation (6)</h3> <ul style="list-style-type: none"> <li>• It is important to find out if:           <ul style="list-style-type: none"> <li>– Patient has ever had adverse reactions to LTBI drugs</li> <li>– Patient is currently on medications that may interact with LTBI drugs</li> </ul> </li> </ul>  <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">46</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Patient Medical Evaluation – Module 4, p.18</i></p>
Slide 47	<div data-bbox="269 800 833 1220" style="border: 1px solid black; padding: 10px;"> <h3 style="text-align: center;">Patient Medical Evaluation (7)</h3> <p><b>4. Establish and build rapport with patient</b></p> <ul style="list-style-type: none"> <li>• HCW should highlight important aspects of treatment:           <ul style="list-style-type: none"> <li>– Benefits of treatment</li> <li>– Importance of adherence to treatment</li> <li>– Possible adverse reactions</li> <li>– Establishment of a follow-up plan</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">47</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Patient Medical Evaluation – Module 4, p.18</i></p>
Slide 48	<div data-bbox="269 1331 833 1751" style="border: 1px solid black; padding: 10px;"> <h3 style="text-align: center;">Patient Medical Evaluation (8)</h3> <ul style="list-style-type: none"> <li>• Because of the interaction between TB and HIV, all patients should be recommended to undergo HIV screening and be offered an HIV test</li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">48</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Patient Medical Evaluation – Module 4, p.18</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 49</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Adverse Reactions to INH (1)</b></p> <ul style="list-style-type: none"> <li>• About 10%-20% of people treated with INH will have mild, abnormal liver test results during treatment <ul style="list-style-type: none"> <li>– In most cases test results return to normal</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 49</p> </div>	<ul style="list-style-type: none"> <li>- Explain that some health care workers have concerns about treating patients for LTBI due to the length of treatment and the possibility of adverse reactions</li> <li>- Stress that, as with any treatment, the risks and benefits of LTBI treatment must be weighed for each individual</li> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Adverse Reactions to INH – Module 4, p.18</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 50</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Adverse Reactions to INH (2)</b> Hepatitis</p> <ul style="list-style-type: none"> <li>• A major risk of INH is hepatitis (inflammation of the liver)</li> <li>• Hepatitis prevents the liver from functioning normally, causing symptoms such as: <ul style="list-style-type: none"> <li>– Nausea</li> <li>– Vomiting</li> <li>– Abdominal pain</li> <li>– Fatigue</li> <li>– Dark urine</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 50</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Adverse Reactions to INH – Module 4, p.18</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 51</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Adverse Reactions to INH (3)</b> Hepatitis</p> <ul style="list-style-type: none"> <li>• INH can cause hepatitis in anyone; however, hepatitis occurs in less than 1% of people taking INH</li> <li>• Certain risk factors increase the risk of serious hepatitis, such as: <ul style="list-style-type: none"> <li>– Older age</li> <li>– Alcoholism</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 51</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Adverse Reactions to INH – Module 4, pp.18-19</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 52</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Adverse Reactions to INH (4)</b> Peripheral Neuropathy</p> <ul style="list-style-type: none"> <li>• INH can cause peripheral neuropathy <ul style="list-style-type: none"> <li>– Damage to sensory nerves of hands and feet</li> <li>– Symptoms include a tingling sensation or weakened sense of touch</li> </ul> </li> <li>• Alcoholism, diabetes, and malnutrition increase risk for peripheral neuropathy <ul style="list-style-type: none"> <li>– People with these conditions should be given vitamin B6</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 52</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Adverse Reactions to INH – Module 4, p. 19</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 53</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Adverse Reactions to RIF</b></p> <ul style="list-style-type: none"> <li>• Hepatitis is more likely to occur when RIF is combined with INH</li> <li>• Other side effects of RIF include: <ul style="list-style-type: none"> <li>– Rash</li> <li>– Gastrointestinal symptoms</li> <li>– Orange discoloration of urine, saliva, and tears</li> <li>– Increased sensitivity to sun</li> <li>– Interaction with other drugs, such as birth control pills and implants, warfarin, and methadone</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 53</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that gastrointestinal symptoms may include abdominal pain, nausea, and anorexia</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Adverse Reactions to RIF – Module 4, p. 19</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 54</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Patient Monitoring (1)</b></p> <ul style="list-style-type: none"> <li>• Persons taking LTBI treatment should be educated about symptoms caused by adverse reactions</li> <li>• Patients need to be evaluated at least monthly during therapy for: <ul style="list-style-type: none"> <li>– Adherence to prescribed regimen</li> <li>– Signs and symptoms of active TB disease</li> <li>– Adverse reactions</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 54</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Stress that patients should be instructed to stop taking the medication and seek medical attention immediately if symptoms of serious adverse reactions occur</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Patient Monitoring – Module 4, p. 19</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 55</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Patient Monitoring (2)</b></p> <ul style="list-style-type: none"> <li>• During evaluation, patients should be: <ul style="list-style-type: none"> <li>– Asked whether they have nausea, abdominal pain, or other symptoms of adverse reactions</li> <li>– Examined by HCW for adverse reactions</li> <li>– Instructed to stop medications and contact HCWs immediately if they have signs or symptoms of hepatitis</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 55</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Patient Monitoring – Module 4, p. 19</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 56</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Patient Monitoring (3)</b></p> <ul style="list-style-type: none"> <li>• People at greatest risk for hepatitis should have liver function tests before starting INH LTBI treatment and every month during therapy: <ul style="list-style-type: none"> <li>– People living with HIV</li> <li>– People with history of liver disorder or disease</li> <li>– People who use alcohol regularly</li> <li>– Women who are pregnant or just had a baby</li> <li>– People taking medications that may increase risk of hepatitis</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 56</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Patient Monitoring – Module 4, p. 20</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 57</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Patient Monitoring (4)</b></p> <ul style="list-style-type: none"> <li>• For all patients, INH should be stopped if liver function test results are: <ul style="list-style-type: none"> <li>– 3 times higher than upper limit of normal range and patient has symptoms</li> </ul> <p style="text-align: center; margin: 5px 0;"><b>OR</b></p> <ul style="list-style-type: none"> <li>– 5 times higher than upper limit of the normal range and patient has no symptoms</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 57</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Patient Monitoring – Module 4, p. 20</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 58</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="text-align: center;">LTBI Treatment Follow-Up</h3> <ul style="list-style-type: none"> <li>• Patients should receive documentation of TST or IGRA results, regimens, and treatment completion dates <ul style="list-style-type: none"> <li>– Patients should present these documents any time they are required to be tested for TB</li> </ul> </li> <li>• Patients should be re-educated about signs and symptoms of TB disease</li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">58</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>LTBI Treatment Follow-Up – Module 4, p. 20</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 59</b></p>	<div style="border: 1px solid black; padding: 10px;"> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;"> <h3>Medical Evaluation Study Question 4.9</h3> </div> <p>Name 4 reasons why patients should receive a medical evaluation before starting LTBI treatment. (pg. 21)</p> <ul style="list-style-type: none"> <li>• Exclude possibility of TB disease</li> <li>• Determine whether they have ever been treated for TB infection or disease</li> <li>• Find out if patient has any medical conditions that may complicate therapy</li> <li>• Establish and build rapport with patient</li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">59</span></p> </div>	<ul style="list-style-type: none"> <li>- Introduce study questions</li> <li>- Ask participants to turn to p. 21 (if participants have print-based modules)</li> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Answers – Module 4, p. 54</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 60</b></p>	<div style="border: 1px solid black; padding: 10px;"> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;"> <h3>LTBI Treatment Study Question 4.10</h3> </div> <p>Why is it important to exclude the possibility of TB disease before giving a patient LTBI treatment? (pg. 21)</p> <p style="margin-top: 10px;">Treating TB disease with LTBI treatment regimen (usually a single drug) can lead to drug resistance.</p> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">60</span></p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Answers – Module 4, p. 54</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 61</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Adverse Reactions Study Question 4.11</b></p> <p><b>What are the symptoms of hepatitis?</b> (pg. 21)</p> <ul style="list-style-type: none"> <li>• Nausea</li> <li>• Vomiting</li> <li>• Abdominal pain</li> <li>• Fatigue</li> <li>• Dark urine</li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">61</span></p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 54</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 62</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Adverse Reactions Study Question 4.12</b></p> <p><b>Who is at greatest risk for hepatitis? What special precautions should be taken for these patients?</b> (pg. 21)</p> <ul style="list-style-type: none"> <li>• <b>People with greatest risk for hepatitis are:</b> <ul style="list-style-type: none"> <li>- People living with HIV</li> <li>- People with a history of liver disorder or disease</li> <li>- People who use alcohol regularly</li> <li>- Women who are pregnant or just had a baby</li> <li>- People who are taking other medications that may increase the risk of hepatitis</li> </ul> </li> <li>• <b>Should have liver function tests before starting INH LTBI treatment and during therapy</b></li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">62</span></p> </div>	<ul style="list-style-type: none"> <li>- Read questions</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 54</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 63</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Adverse Reactions Study Question 4.13</b></p> <p><b>How often should patients be evaluated for signs and symptoms of adverse reactions during LTBI treatment?</b> (pg. 21)</p> <ul style="list-style-type: none"> <li>• <b>All patients receiving LTBI treatment should be evaluated at least monthly during therapy.</b></li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">63</span></p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 54</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 64</b></p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <h2 style="margin: 0;">Treatment of TB Disease</h2> <hr style="width: 50%; margin: 5px auto;"/> <p style="font-size: small; margin-top: 20px;">64</p> </div>	<ul style="list-style-type: none"> <li>- Introduce section</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Treatment of TB Disease – Module 4, pp. 23-46</i></p>						
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 65</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="margin: 0;">Treatment of TB Disease (1)</h3> <ul style="list-style-type: none"> <li>• <b>Treating TB disease benefits both the person who has TB and the community</b> <ul style="list-style-type: none"> <li>– For patient, prevents disability and death; restores health</li> <li>– For community, prevents further transmission of TB</li> </ul> </li> <li>• <b>TB disease must be treated for <u>at least 6 months</u>; in some cases, treatment lasts longer</b> <ul style="list-style-type: none"> <li>– e.g., patients with cavities on chest x-ray and positive sputum cultures at 2 months should have treatment extended to 9 months</li> </ul> </li> </ul> <p style="font-size: x-small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">65</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Treatment of TB Disease – Module 4, p. 23</i></p>						
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 66</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="margin: 0;">Treatment of TB Disease (2)</h3> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #008080; color: white; text-align: center; padding: 5px;"><b>Initial Phase</b></td> <td style="padding: 5px;"> <ul style="list-style-type: none"> <li>• First 8 weeks of treatment</li> <li>• Most bacilli killed during this phase</li> <li>• 4 drugs used</li> </ul> </td> </tr> <tr> <td style="background-color: #008080; color: white; text-align: center; padding: 5px;"><b>Continuation Phase</b></td> <td style="padding: 5px;"> <ul style="list-style-type: none"> <li>• After first 8 weeks of TB disease treatment</li> <li>• Bacilli remaining after initial phase are treated with at least 2 drugs</li> </ul> </td> </tr> <tr> <td style="background-color: #008080; color: white; text-align: center; padding: 5px;"><b>Relapse</b></td> <td style="padding: 5px;"> <ul style="list-style-type: none"> <li>• Occurs when treatment is not continued for long enough</li> <li>• Surviving bacilli may cause TB disease at a later time</li> </ul> </td> </tr> </table> <p style="font-size: x-small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">66</span></p> </div>	<b>Initial Phase</b>	<ul style="list-style-type: none"> <li>• First 8 weeks of treatment</li> <li>• Most bacilli killed during this phase</li> <li>• 4 drugs used</li> </ul>	<b>Continuation Phase</b>	<ul style="list-style-type: none"> <li>• After first 8 weeks of TB disease treatment</li> <li>• Bacilli remaining after initial phase are treated with at least 2 drugs</li> </ul>	<b>Relapse</b>	<ul style="list-style-type: none"> <li>• Occurs when treatment is not continued for long enough</li> <li>• Surviving bacilli may cause TB disease at a later time</li> </ul>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Treatment of TB Disease – Module 4, p. 23</i></p>
<b>Initial Phase</b>	<ul style="list-style-type: none"> <li>• First 8 weeks of treatment</li> <li>• Most bacilli killed during this phase</li> <li>• 4 drugs used</li> </ul>							
<b>Continuation Phase</b>	<ul style="list-style-type: none"> <li>• After first 8 weeks of TB disease treatment</li> <li>• Bacilli remaining after initial phase are treated with at least 2 drugs</li> </ul>							
<b>Relapse</b>	<ul style="list-style-type: none"> <li>• Occurs when treatment is not continued for long enough</li> <li>• Surviving bacilli may cause TB disease at a later time</li> </ul>							

Slide 67	<div style="border: 1px solid black; padding: 10px;"> <h3 style="text-align: center; color: #00BFC4;">Treatment of TB Disease (3)</h3> <ul style="list-style-type: none"> <li>• Initial regimen should contain the following four drugs: <ul style="list-style-type: none"> <li>– Isoniazid (INH)</li> <li>– Rifampin (RIF)</li> <li>– Pyrazinamide (PZA)</li> <li>– Ethambutol (EMB)</li> </ul> </li> </ul> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="text-align: center;"> <p>INH</p>  </div> <div style="text-align: center;"> <p>RIF</p>  </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="text-align: center;"> <p>PZA</p>  </div> <div style="text-align: center;"> <p>EMB</p>  </div> </div> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 67</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Note that when drug susceptibility results are available, clinicians may change the regimen accordingly</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Treatment of TB Disease – Module 4, p. 23</i></p>
Slide 68	<div style="border: 1px solid black; padding: 10px;"> <h3 style="text-align: center; color: #00BFC4;">Treatment of TB Disease (4)</h3> <ul style="list-style-type: none"> <li>• Treatment must contain multiple drugs to which organisms are susceptible</li> <li>• Treatment with a single drug can lead to the development of drug-resistant TB</li> </ul> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 68</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Treatment of TB Disease – Module 4, p. 23</i></p>
Slide 69	<div style="border: 1px solid black; padding: 10px;"> <h3 style="text-align: center; color: #00BFC4;">Preventing Drug Resistance (1)</h3> <ul style="list-style-type: none"> <li>• Drug resistance can develop when patients are prescribed an inappropriate regimen <ul style="list-style-type: none"> <li>– TB disease must be treated with at least 2 drugs to which bacilli are susceptible</li> <li>– Using only one drug can create a population of tubercle bacilli resistant to that drug</li> <li>– Adding a single drug to failing regimen may have the same effect as only using one drug</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 69</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that when two or more drugs are used together, each drug helps prevent the emergence of bacilli that are resistant to the other drugs</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Preventing Drug Resistance – Module 4, p. 24</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 70</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Preventing Drug Resistance (2)</b></p> <ul style="list-style-type: none"> <li>• <b>Resistance can develop when patients do not take drugs as prescribed</b> <ul style="list-style-type: none"> <li>– Patients do not take all of their pills</li> <li>– Patients do not take pills as often as prescribed</li> </ul> </li> <li>• <b>When this happens, patients may expose the bacilli to a single drug</b></li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">70</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Preventing Drug Resistance – Module 4, p. 24</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 71</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Preventing Drug Resistance (3)</b></p> <ul style="list-style-type: none"> <li>• <b>Factors that increase chance of patient having or developing drug-resistant TB:</b> <ul style="list-style-type: none"> <li>– Patient has spent time with someone with active drug-resistant TB disease</li> <li>– Patient does not take their medicine regularly</li> <li>– Patient does not take all of their medicine</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">71</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Preventing Drug Resistance – Module 4, p. 24</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 72</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Preventing Drug Resistance (4)</b></p> <ul style="list-style-type: none"> <li>• <b>Factors that increase chance of patient having or developing drug-resistant TB (cont.):</b> <ul style="list-style-type: none"> <li>– Patient develops active TB disease after having taken TB medicine in the past</li> <li>– Patient comes from area of the world where drug-resistant TB is common</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">72</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Preventing Drug Resistance – Module 4, p. 24</i></p>

Slide 73

## Treatment of TB Disease

### Treatment Regimens and Dosage Recommendations

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- Introduce section

Slide 74

**Table 4.3 TB Treatment Regimens\* (1)**

Regimen	Initial Phase		Continuation Phase			
	Drugs	Interval & Doses <sup>a</sup>	Regimen	Drugs	Interval & Doses <sup>a</sup> §	Range of Total Doses
1	INH RIF PZA EMB	7 days/week for 56 doses (8 weeks) or 5 days/week for 40 doses (8 weeks) <sup>f</sup>	1a	INH RIF	7 days/week for 126 doses or 5 days/week for 90 doses (18 weeks) <sup>†</sup>	182-130 (26 weeks)
			1b*	INH RIF	2 days/week for 36 doses (18 weeks) <sup>†</sup>	92-76 (26 weeks)
			1c**	INH RPT	1 day/week for 18 doses (18 weeks) <sup>†</sup>	74-58 (26 weeks)

\*For more information on strength of recommendation and quality of supporting evidence, refer to ATS, CDC, and IDSA MMWR Treatment of Tuberculosis Guidelines.  
<sup>a</sup>When DOT is used, drugs may be given 5 days/week and the necessary doses adjusted accordingly.  
<sup>§</sup>Patients with cavitation on initial chest x-ray and positive cultures at completion of 2 months of therapy should receive a 7-month continuation phase.  
<sup>†</sup>Patients on regimens given less than 7 days a week should receive DOT.  
<sup>‡</sup>Regimens give less than 3 times a week are not recommended for HIV-infected patients with CD4+ counts less than 100.  
<sup>\*\*\*</sup>Used only for HIV-negative patients with negative sputum smears at completion of 2 months of therapy and who do not have cavitation on initial chest x-ray. For patients started on this regimen and found to have positive culture from the 2-month specimen, treatment should be extended an extra 3 months.

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- Ask participants turn to p. 26 for table 4.3 that describes recommended treatment regimens since it may be difficult to view the table on the slide (if participants have print-based modules)
- Explain that there are several options for daily and intermittent therapy

*TB Treatment Regimens – Module 4, p. 26*

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**Table 4.3 TB Treatment Regimens\* (2)**

Regimen	Initial Phase		Continuation Phase			
	Drugs	Interval & Doses <sup>a</sup>	Regimen	Drugs	Interval & Doses <sup>a</sup> §	Range of Total Doses
2	INH RIF PZA EMB	7 days/week for 14 doses (2 weeks), then 2 days/week for 12 doses (6 weeks) or 5 days/week for 10 doses (2 weeks) <sup>†</sup> , then 2 days/week for 12 Doses (6 weeks)	2a*	INH RIF	2 days/week for 36 doses (18 weeks) <sup>†</sup>	62-58 (26 weeks)
			2b**	INH RPT	1 day/week for 18 doses (18 weeks) <sup>†</sup>	44-40 (26 weeks)

\*For more information on strength of recommendation and quality of supporting evidence, refer to ATS, CDC, and IDSA MMWR Treatment of Tuberculosis Guidelines.  
<sup>a</sup>When DOT is used, drugs may be given 5 days/week and the necessary doses adjusted accordingly.  
<sup>§</sup>Patients with cavitation on initial chest x-ray and positive cultures at completion of 2 months of therapy should receive a 7-month continuation phase.  
<sup>†</sup>Patients on regimens given less than 7 days a week should receive DOT.  
<sup>‡</sup>Regimens give less than 3 times a week are not recommended for HIV-infected patients with CD4+ counts less than 100.  
<sup>\*\*\*</sup>Used only for HIV-negative patients with negative sputum smears at completion of 2 months of therapy and who do not have cavitation on initial chest x-ray. For patients started on this regimen and found to have positive culture from the 2-month specimen, treatment should be extended an extra 3 months.

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- Review slide content

*TB Treatment Regimens – Module 4, p. 26*

### TB Treatment Regimens\* (3)

Table 4.3

Initial Phase			Continuation Phase			
Regimen	Drugs	Interval & Doses <sup>a</sup>	Regimen	Drugs	Interval & Doses <sup>a, §</sup>	Range of Total Doses
3	INH RIF PZA EMB	3 times weekly for 24 doses (8 weeks)	3a	INH RIF	3 times weekly for 54 doses (18 weeks) <sup>†</sup>	78 (26 weeks)

\*For more information on strength of recommendation and quality of supporting evidence, refer to ATS, CDC, and IDSA MMWR Treatment of Tuberculosis Guidelines.  
<sup>a</sup>When DOT is used, drugs may be given 5 days/week and the necessary doses adjusted accordingly.  
<sup>§</sup>Patients with cavitation on initial chest x-ray and positive cultures at completion of 2 months of therapy should receive a 7-month continuation phase.  
<sup>†</sup>Patients on regimens given less than 7 days a week should receive DOT.  
<sup>‡</sup>Regimens given less than 3 times a week are not recommended for HIV-infected patients with CD4+ counts less than 100.  
<sup>¶</sup>Used only for HIV-negative patients with negative sputum smears at completion of 2 months of therapy and who do not have cavitation on initial chest x-ray. For patients started on this regimen and found to have positive culture from the 2-month specimen, treatment should be extended an extra 3 months.

- Review slide content

TB Treatment Regimens – Module 4, p. 26

### TB Treatment Regimens\* (4)

Table 4.3

Initial Phase			Continuation Phase			
Regimen	Drugs	Interval & Doses <sup>a</sup>	Regimen	Drugs	Interval & Doses <sup>a, §</sup>	Range of Total Doses
4	INH RIF EMB	7 days/week for 56 doses (8 weeks) or 5 days/week for 40 doses (8 weeks) <sup>†</sup>	4a	INH RIF	7 days/week for 217 doses (31 weeks) or 5 days/week for 155 doses (31 weeks) <sup>†</sup>	273-195 (39 weeks)
			4b <sup>*</sup>	INH RIF	Twice weekly for 62 doses (31 weeks) <sup>†</sup>	118-102 (39 weeks)

\*For more information on strength of recommendation and quality of supporting evidence, refer to ATS, CDC, and IDSA MMWR Treatment of Tuberculosis Guidelines.  
<sup>a</sup>When DOT is used, drugs may be given 5 days/week and the necessary doses adjusted accordingly.  
<sup>§</sup>Patients with cavitation on initial chest x-ray and positive cultures at completion of 2 months of therapy should receive a 7-month continuation phase.  
<sup>†</sup>Patients on regimens given less than 7 days a week should receive DOT.  
<sup>‡</sup>Regimens given less than 3 times a week are not recommended for HIV-infected patients with CD4+ counts less than 100.  
<sup>¶</sup>Used only for HIV-negative patients with negative sputum smears at completion of 2 months of therapy and who do not have cavitation on initial chest x-ray. For patients started on this regimen and found to have positive culture from the 2-month specimen, treatment should be extended an extra 3 months.

- Review slide content

TB Treatment Regimens – Module 4, p. 26

### Drug Dosage Recommendations<sup>1</sup> (1)

Table 4.4

Drug	Adults/Children <sup>2</sup>	Dose in mg/kg (maximum dosage in parentheses)			
		Daily	1 time/week <sup>3</sup>	2 times/week <sup>3</sup>	3 times/week <sup>3</sup>
INH	Adults	5 mg/kg (300 mg)	15 mg/kg (900 mg)	15 mg/kg (900 mg)	15 mg/kg (900 mg)
	Children	10-15 mg/kg (300 mg)		20-30 mg/kg (900 mg)	
RIF	Adults	10 mg/kg (600 mg)		10 mg/kg (600 mg)	10 mg/kg (600 mg)
	Children	10-20 mg/kg (600 mg)		10-20 mg/kg (600 mg)	
RBT	Adults	5 mg/kg (300 mg)		5 mg/kg (300 mg)	5 mg/kg (300 mg)
	Children	Appropriate dosing for children unknown			

<sup>1</sup> Although these regimens are broadly applicable, modifications may be needed for certain circumstances (patients on ARVs). For more information, refer to the ATS, CDC, and IDSA MMWR Treatment of Tuberculosis Guidelines.  
<sup>2</sup> For purposes of this table adults dosing begins at age 15 years. Children weighing more than 40 kg should be dosed as adults. Adjust doses as the patients' weight changes.  
<sup>3</sup> All patients prescribed an intermittent regimen should be given DOT.

- Ask participants turn to p. 27 for table 4.4 that describes recommended dosage recommendations since it may be difficult to view the table on the slide (if participants have print-based modules)
- Explain that although these regimens are broadly applicable, modifications may be needed for certain circumstances (e.g., patients on antiretrovirals)

Drug Dosage Recommendations – Module 4, p. 27

### Drug Dosage Recommendations<sup>1</sup> (2)

Dose in mg/kg (maximum dosage in parentheses)

Drug	Adults/Children <sup>2</sup>	Daily	1 time/week <sup>3</sup>	2 times/week <sup>3</sup>	3 times/week <sup>3</sup>	
RPT	Adults		10 mg/kg (600 mg) (cont. phase)			
	Children	This drug is not approved for use in children				
PZA	Adults	Weight	40-55 kg	18.2-25 mg/kg (1000 mg)	36.4-50 mg/kg (2000 mg)	27.3-37.5 mg/kg (1500 mg)
			56-75 kg	20-26.8 mg/kg (1500 mg)	40-53.6 mg/kg (3000 mg)	33.3-44.6 (2500 mg)
			76-90 kg	22.2-26.3 mg/kg (2000 mg)	44.4-52.6 mg/kg (4000 mg)	33.3-39.5 mg/kg (3000 mg)
	Children	15-30 mg/kg (2000 mg)		50 mg/kg (2000 mg)		

1 Although these regimens are broadly applicable, modifications may be needed for certain circumstances (patients on ARVs). For more information, refer to the ATS, CDC, and IDSA *MHW* Treatment of Tuberculosis Guidelines.  
 2 For purposes of this table adults dosing begins at age 15 years. Children weighing more than 40 kg should be dosed as adults. Adjust doses as the patient's weight changes.  
 3 All patients prescribed an intermittent regimen should be given DOT.

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- Review slide content

*Drug Dosage Recommendations – Module 4, p. 27*

### Drug Dose Recommendations<sup>1</sup> (3)

Table 4.4  
Dose in mg/kg (maximum dosage in parentheses)

Drug	Adults/Children <sup>2</sup>	Daily	1 time/week <sup>3</sup>	2 times/week <sup>3</sup>	3 times/week <sup>3</sup>	
EMB <sup>4</sup>	Adults	Weight	40-55 kg	14.5-20 mg/kg (800 mg)	36.4-50 mg/kg (2000 mg)	21.8-30 mg/kg (1200 mg)
			56-75 kg	16-21.4 mg/kg (1200 mg)	37.3-50 mg/kg (2800 mg)	26.7-35.7 mg/kg (2000 mg)
			76-90 kg	17.8-21.1 mg/kg (1800 mg)	44.4-52.6 mg/kg (4000 mg)	26.7-31.6 mg/kg (2400 mg)
	Children	15-20 mg/kg (1000 mg)		50 mg/kg (2500 mg)		

1 Although these regimens are broadly applicable, modifications may be needed for certain circumstances (patients on ARVs). For more information, refer to the ATS, CDC, and IDSA *MHW* Treatment of Tuberculosis Guidelines.  
 2 For purposes of this table adults dosing begins at age 15 years. Children weighing more than 40 kg should be dosed as adults. Adjust doses as the patient's weight changes.  
 3 All patients prescribed an intermittent regimen should be given DOT.  
 4 Ethambutol should be used with caution in young children since it is difficult to monitor their vision. However, if they have TB that is resistant to INH or RIF, dose of 15 mg/kg per day can be used.

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- Review slide content

*Drug Dosage Recommendations – Module 4, p. 27*

## Treatment of TB Disease

### Study Question 4.14

**Why must TB disease be treated for at least 6 months?** (pg. 28)

**Even though most bacilli are killed in the first 8 weeks, some bacilli can survive. Therefore, treatment must continue in order to kill all remaining bacilli.**

Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease

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- Introduce study questions
- Ask participants to turn to p. 28 (if participants have print-based modules)
- Read question
- Ask participants for answers

*Answers – Module 4, p. 55*

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 82</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Treatment of TB Disease Study Question 4.15</b></p> <p><b>Which 4 drugs are recommended for the initial treatment of TB disease?</b> (pg. 28)</p> <p style="margin-left: 40px;">Initial regimen should include INH, RIF, PZA, and EMB.</p> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">82</span></p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Answers – Module 4, p. 55</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 83</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Treatment of TB Disease Study Question 4.16</b></p> <p><b>Why should at least 2 drugs be used to treat TB disease?</b> (pg. 28)</p> <p style="margin-left: 40px;">Using only one drug can create a population of tubercle bacilli that is resistant to that drug. When 2 or more drugs are used together, each drug helps prevent the emergence of bacilli that are resistant to the other drugs.</p> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">83</span></p> </div>	<ul style="list-style-type: none"> <li>- Ask for a volunteer to read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Answers – Module 4, p. 55</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 84</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Drug Resistance Study Question 4.17</b></p> <p><b>Name 2 factors that can lead to drug resistance.</b> (pg. 28)</p> <p style="margin-left: 40px;">Drug resistance can develop when:</p> <ul style="list-style-type: none"> <li>• Patients are prescribed an inappropriate regimen for treatment</li> <li>• Patients do not follow treatment regimens as prescribed</li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">84</span></p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Answers – Module 4, p. 55</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Slide 85</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <h2 style="margin: 0;">Treatment of TB Disease</h2> <hr style="width: 50%; margin: 5px auto;"/> <h3 style="margin: 0;">Special Considerations and Alternative Treatment Regimens</h3> <p style="font-size: small; margin-top: 20px;">85</p> </div>	<ul style="list-style-type: none"> <li>- Introduce section</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Slide 86</p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="margin: 0;">Special Considerations (1)</h3> <ul style="list-style-type: none"> <li>• TB medical experts should be consulted for complicated and challenging TB treatment issues</li> <li>• Consultation can be provided by State TB Programs and/or the CDC-funded TB Regional Training and Medical Consultation Centers (RTMCCs)</li> </ul> <p style="font-size: small; margin-top: 10px;"><a href="http://www.cdc.gov/TB/education/rtmc/default.htm">www.cdc.gov/TB/education/rtmc/default.htm</a></p> <p style="font-size: x-small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease</p> <p style="text-align: right; font-size: small;">86</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that the Regional Training and Medical Consultation Centers (RTMCCs) are regionally assigned to cover all 50 states and the U.S. territories</li> <li>- Tell participants that they may learn more about the RTMCCs by going to the website shown on the slide</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Slide 87</p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="margin: 0;">Special Considerations (2)</h3> <h4 style="margin: 0;">People Living with HIV</h4> <ul style="list-style-type: none"> <li>• Treatment for HIV patients is generally the same as for those without HIV-infection with two exceptions: <ul style="list-style-type: none"> <li>– Once weekly INH and rifapentine in continuation phase <u>should not</u> be used</li> <li>– Patients with advanced HIV should be treated daily or three times weekly in the initial and continuation phase</li> </ul> </li> </ul> <p style="font-size: x-small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease</p> <p style="text-align: right; font-size: small;">87</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that the management of HIV-infected TB patients is complex and therefore medical experts should be involved in the care and treatment of patients with HIV and TB</li> </ul> <p style="text-align: right; font-style: italic; margin-top: 20px;">People Living with HIV–Module 4, p. 29</p>

Slide 88	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Special Considerations (3)</b> People Living With HIV</p> <ul style="list-style-type: none"> <li>• Patients should receive a minimum of 6 months treatment and be closely monitored <ul style="list-style-type: none"> <li>– Continuation phase may need to be extended to 7 months (9 months total treatment time), if patient is responding slowly to treatment</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">88</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>People Living with HIV–Module 4, p. 29</i></p>
Slide 89	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Special Considerations (4)</b> People Living With HIV</p> <ul style="list-style-type: none"> <li>• DOT should be provided for all TB patients living with HIV</li> <li>• If TB patient is living with HIV and on ARV: <ul style="list-style-type: none"> <li>– It is important to be aware of the interaction of RIF with some ARV drugs</li> </ul> </li> <li>• Rifabutin has fewer drug interaction problems and may be used as a substitute for RIF for some patients</li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">89</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>People Living with HIV – Module 4, p. 29</i></p>
Slide 90	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Special Considerations (5)</b> Pregnant Women</p> <ul style="list-style-type: none"> <li>• Treatment should begin as soon as TB disease is diagnosed</li> <li>• Preferred initial regimen is INH, RIF, and EMB for at least 9 months</li> <li>• Drugs that should not be used <ul style="list-style-type: none"> <li>– Pyrazinamide (PZA)</li> <li>– Streptomycin (SM)</li> </ul> </li> <li>• Vitamin B6 supplements are recommended for all pregnant women taking INH</li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">90</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that PZA should not be used because effects on the fetus are unknown</li> <li>- Explain that SM should not be used because it has harmful effects on the fetus</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Pregnant Women – Module 4, p. 29</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 91</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Special Considerations (6)</b> Breastfeeding</p> <ul style="list-style-type: none"> <li>• <b>Women being treated with first-line TB drugs should <u>not</u> be discouraged from breastfeeding</b> <ul style="list-style-type: none"> <li>– Only small concentration found in breast milk</li> <li>– Not harmful to infant</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">91</span></p> </div>	<p>- Review slide content</p> <p style="text-align: right; margin-top: 20px;"><i>Breastfeeding – Module 4, p. 30</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 92</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Special Considerations (7)</b> Breastfeeding</p> <ul style="list-style-type: none"> <li>• <b>Drugs in breast milk should not be considered effective treatment for TB disease for infant</b></li> <li>• <b>Vitamin B6 supplements are recommended for breastfeeding women</b></li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">92</span></p> </div>	<p>- Review slide content</p> <p style="text-align: right; margin-top: 20px;"><i>Breastfeeding – Module 4, p. 30</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 93</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Special Considerations (8)</b> Children</p> <ul style="list-style-type: none"> <li>• <b>Infants and children younger than 4 years should start TB treatment as soon as possible</b></li> <li>• <b>Recommended treatment:</b> <ul style="list-style-type: none"> <li>– 6 months</li> <li>– 3 drugs (INH, RIF, PZA) in initial phase</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">93</span></p> </div>	<p>- Review slide content</p> <p style="text-align: right; margin-top: 20px;"><i>Children – Module 4, p. 30</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 94</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Special Considerations (9)</b> Children</p> <ul style="list-style-type: none"> <li>• <b>EMB is not recommended for children unless TB is resistant to INH, child is a contact of patient with INH-resistant TB, or TB manifestation is similar to TB in adults (e.g., cavities or extensive upper-lobe infiltrates)</b></li> <li>• <b>Pills may have to be crushed or given in liquid form</b></li> <li>• <b>It is not recommended to treat children 3 times a week</b></li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">94</span></p> </div>	<p>- Review slide content</p> <p style="text-align: right; margin-top: 100px;"><i>Children – Module 4, p. 30</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 95</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Special Considerations (10)</b> People with Extrapulmonary Disease</p> <ul style="list-style-type: none"> <li>• <b>Regimens used for treating pulmonary TB are also effective for treating extrapulmonary TB</b></li> <li>• <b>Infants and children with miliary TB (disseminated TB), bone and joint TB, or TB meningitis should receive at least 9-12 months of treatment</b></li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">95</span></p> </div>	<p>- Review slide content</p> <p style="text-align: right; margin-top: 100px;"><i>People with Extrapulmonary Disease – Module 4, p. 30</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 96</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Alternative Treatment Regimens (1)</b> Drug-Resistant TB</p> <ul style="list-style-type: none"> <li>• <b>Alternative regimens should be used for treating drug-resistant TB</b></li> <li>• <b>Treatment of drug-resistant TB should always be done under the supervision of a medical expert</b></li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">96</span></p> </div>	<p>- Review slide content</p> <p style="text-align: right; margin-top: 100px;"><i>Drug-Resistant TB – Module 4, p. 31</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 97</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Alternative Treatment Regimens (2)</b> <b>Drug-Resistant TB</b></p> <ul style="list-style-type: none"> <li>• INH-resistant TB can be treated with the following regimens: <ul style="list-style-type: none"> <li>– RIF, EMB, and PZA for 6-9 months</li> <li>– RIF and EMB for 12 months</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 97</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Drug-Resistant TB – Module 4, p. 31</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 98</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Alternative Treatment Regimens (3)</b> <b>MDR TB</b></p> <ul style="list-style-type: none"> <li>• Resistant to INH and RIF</li> <li>• More difficult to treat than drug-susceptible TB</li> <li>• Drugs that can be used are less effective and are more likely to cause adverse reactions</li> <li>• Treatment can last longer than 2 years or more</li> <li>• Surgery is sometimes use to remove infected site</li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 98</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Alternative Treatment Regimens – Module 4, p. 31</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 99</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Alternative Treatment Regimens (4)</b> <b>Extensively Drug-Resistant TB (XDR TB)</b></p> <ul style="list-style-type: none"> <li>• XDR TB is resistant to INH, RIF, plus any fluoroquinolone, and at least one injectable second-line drug (e.g., amikacin, kanamycin, or capreomycin)</li> <li>• XDR TB patients have less effective treatment options</li> <li>• XDR TB is <u>very</u> difficult to treat</li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 99</p> </div>	<ul style="list-style-type: none"> <li>- Explain that XDR TB is a rare type of MDR TB</li> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Alternative Treatment Regimen s– Module 4, p. 31</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 100</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Alternative Treatment Regimens (5)</b> <b>XDR TB</b></p> <ul style="list-style-type: none"> <li>• <b>Successful outcomes for patient depend greatly on:</b> <ul style="list-style-type: none"> <li>– <b>Extent of drug resistance</b></li> <li>– <b>Severity of disease</b></li> <li>– <b>Whether patient's immune system is compromised</b></li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">100</span></p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Alternative Treatment Regimens – Module 4, p. 31</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 101</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Special Considerations</b> <b>Study Question 4.18</b></p> <p><b>What treatment regimens should be used for TB patients living with HIV? (pg. 32)</b></p> <ul style="list-style-type: none"> <li>• <b>Daily or three times weekly therapy</b></li> <li>• <b>6 months of treatment; if not responding to treatment, patient should be reevaluated and continuation phase can be increased to 7 months (9 months total treatment)</b></li> <li>• <b>DOT should be used</b></li> <li>• <b>If HIV-infected TB patient is on ARVs, it is important to be aware of the interaction of rifampin with some ARV drugs</b></li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">101</span></p> </div>	<ul style="list-style-type: none"> <li>- Introduce study questions</li> <li>- Ask participants to turn to p. 32 (if participants have print-based modules)</li> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Answers – Module 4, p. 55</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 102</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Special Considerations</b> <b>Study Question 4.19</b></p> <p><b>In what special situations should treatment for TB disease last longer than the usual course of treatment? (pg. 32)</b></p> <ul style="list-style-type: none"> <li>• <b>Patients with cavities in chest x-ray and positive sputum culture at 2 months</b></li> <li>• <b>Patients living with HIV may need treatment for 9 months</b></li> <li>• <b>Pregnant women should receive at least 9 months treatment, if PZA is not used</b></li> <li>• <b>Infants and children with miliary TB, bone and joint TB, or TB meningitis should receive at least 9 - 12 months of treatment</b></li> <li>• <b>INH-resistant TB treatment can last 12 months; treatment for MDR TB can last 2 years or longer</b></li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease <span style="float: right;">102</span></p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Answers – Module 4, p. 56</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 103</b></p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <h2 style="margin: 0;">Treatment of TB Disease</h2> <h3 style="margin: 0;">Treatment and Monitoring Plan and Adverse Reactions</h3> <p style="font-size: small; margin-top: 20px;">103</p> </div>	<ul style="list-style-type: none"> <li>- Introduce section</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 104</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="margin: 0;">Treatment and Monitoring Plan</h3> <ul style="list-style-type: none"> <li>• <b>Every TB patient should have a specific treatment and monitoring plan developed in collaboration with local health department</b></li> <li>• <b>Plan should include:</b> <ul style="list-style-type: none"> <li>– Description of treatment regimen</li> <li>– Methods of: <ul style="list-style-type: none"> <li>• <b>Monitoring for adverse reactions</b></li> <li>• <b>Assessing and ensuring adherence to treatment</b></li> <li>• <b>Evaluating treatment response</b></li> </ul> </li> </ul> </li> </ul> <p style="font-size: x-small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 104</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Note that the treatment and monitoring plan should be done within one week of suspected diagnosis</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Treatment and Monitoring Plan – Module 4, p. 34</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 105</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="margin: 0;">Monitoring Adverse Reactions (1)</h3> <ul style="list-style-type: none"> <li>• <b>Patients should have baseline blood and vision tests to detect problems that may complicate treatment</b></li> <li>• <b>Children only need vision tests, unless there are other medical conditions that may complicate treatment</b></li> </ul> <p style="font-size: x-small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 105</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Treatment and Monitoring Plan – Module 4, p. 34</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 106</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="color: #008080;">Monitoring Adverse Reactions (2)</h3> <ul style="list-style-type: none"> <li>• Follow-up tests should be done periodically if: <ul style="list-style-type: none"> <li>– Results of baseline tests indicate abnormalities</li> <li>– Patient has symptoms that may be due to adverse reactions</li> </ul> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 106</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Monitoring Adverse Reactions – Module 4, p. 34</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 107</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="color: #008080;">Monitoring Adverse Reactions (3)</h3> <ul style="list-style-type: none"> <li>• Patients should be educated about symptoms caused by adverse reactions to drugs</li> <li>• Patients should be seen by clinician at least monthly during treatment and evaluated for possible adverse reactions</li> <li>• Public health workers who have regular contact with patients should ask about adverse reactions to treatment</li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 107</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that patients should also be educated about minor side effects of treatment; such as orange discoloration of urine from rifampin</li> <li>- Note that monitoring for adverse reactions must be individualized, depending on the drugs the patient is taking and the patient’s risk for adverse reactions</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Monitoring Adverse Reactions – Module 4, p. 34</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 108</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="color: #008080;">Monitoring Adverse Reactions (4)</h3> <ul style="list-style-type: none"> <li>• If patient has symptoms of a serious adverse reaction, HCW should: <div style="display: flex; align-items: flex-start; margin-left: 20px;"> <ul style="list-style-type: none"> <li>– Instruct patient to stop medication</li> <li>– Report situation to clinician and arrange for medical evaluation</li> <li>– Note symptoms in patient’s record</li> </ul>  </div> </li> </ul> <p style="font-size: small; margin-top: 10px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 108</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Monitoring Adverse Reactions – Module 4, p. 35</i></p>

Slide 109

### Adverse Reactions to TB Drugs (1)

Caused by	Adverse Reaction	Signs and Symptoms	Significance of Reaction*
Any drug	Allergic	<ul style="list-style-type: none"> <li>Skin rash</li> </ul>	Serious
EMB	Eye damage	<ul style="list-style-type: none"> <li>Blurred or changed vision</li> <li>Changed color vision</li> </ul>	Serious
INH PZA RIF	Hepatitis	<ul style="list-style-type: none"> <li>Abdominal pain</li> <li>Abnormal liver function test results</li> <li>Dark urine</li> <li>Fatigue</li> <li>Fever for 3+ days</li> <li>Flulike symptoms</li> <li>Lack of appetite</li> <li>Nausea</li> <li>Vomiting</li> <li>Yellowish skin or eyes</li> </ul>	Serious

Table 4.5 Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 109

- Ask participants turn to p. 36 (if participants have print-based modules)
- Explain that this table describes adverse reactions to TB drugs
- Review slide content

*Adverse Reactions to TB Drugs – Module 4, p. 36*

Slide 110

### Adverse Reactions to TB Drugs (2)

Caused by	Adverse Reaction	Signs and Symptoms	Significance of Reaction*
INH	Peripheral neuropathy	<ul style="list-style-type: none"> <li>Tingling sensation in hands and feet</li> </ul>	Serious
PZA	Stomach upset	<ul style="list-style-type: none"> <li>Stomach upset</li> <li>Vomiting</li> <li>Lack of appetite</li> </ul>	Serious
	Increased uric acid	<ul style="list-style-type: none"> <li>Abnormal uric acid level</li> <li>Joint aches</li> <li>Gout (rare)</li> </ul>	Not serious unless symptomatic

Table 4.5

Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 110

- Review slide content

*Adverse Reactions to TB Drugs – Module 4, p. 36*

Slide 111

### Adverse Reactions to TB Drugs (3)

Caused by	Adverse Reaction	Signs and Symptoms	Significance of Reaction*
RIF	Bleeding problems	<ul style="list-style-type: none"> <li>Easy bruising</li> <li>Slow blood clotting</li> </ul>	Serious
	Discoloration of body fluids	<ul style="list-style-type: none"> <li>Orange urine, sweat, or tears</li> <li>Permanently stained soft contact lenses</li> </ul>	Minor
	Drug interactions	<ul style="list-style-type: none"> <li>Interferes with certain medications, such as birth control pills, birth control implants, and methadone treatment</li> </ul>	May be serious or minor
	Sensitivity to the sun	<ul style="list-style-type: none"> <li>Frequent sunburn</li> </ul>	Minor

Table 4.5

\* Patients should stop medication for serious adverse reactions and consult a clinician immediately. Patients can continue taking medication if they have minor adverse reactions.

Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 111

- Review slide content

*Adverse Reactions to TB Drugs – Module 4, p. 36*

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 112</b></p>	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>TB Treatment and Monitoring Plan Study Question 4.20</b></p> <p><b>What should be included in each patient's treatment plan?</b> (pg. 37)</p> <ul style="list-style-type: none"> <li>• Description of treatment regimen</li> <li>• Methods of monitoring for adverse reactions</li> <li>• Methods of assessing and ensuring adherence to the treatment</li> <li>• Methods for evaluating treatment response</li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 112</p> </div>	<ul style="list-style-type: none"> <li>- Introduce study questions</li> <li>- Ask participants to turn to p. 37 (if participants have print-based modules)</li> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 56</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 113</b></p>	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>Adverse Reactions to TB Drugs Study Question 4.21</b></p> <p><b>Name the drug or drugs that may cause each of the following symptoms or adverse reaction.</b> (pg. 37)</p> <ul style="list-style-type: none"> <li>• Peripheral neuropathy: INH</li> <li>• Hepatitis: INH, PZA, RIF</li> <li>• Eye damage: EMB</li> <li>• Orange discoloration of the urine: RIF</li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 113</p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 56</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 114</b></p>	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>TB Treatment Monitoring Study Question 4.22</b></p> <p><b>How often should patients be monitored for adverse reactions to TB drugs?</b> (pg. 37)</p> <p style="text-align: center;"><b>All patients should be seen at least monthly during treatment and evaluated for possible adverse reactions.</b></p> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 114</p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 56</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 115</b></p>	<div data-bbox="269 231 833 655" style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Treatment of TB Disease</b></p> <p style="text-align: center;"><b>Adherence and Evaluating Patients' Response to Treatment</b></p> <p style="text-align: right;">115</p> </div>	<ul style="list-style-type: none"> <li>- Introduce section</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 116</b></p>	<div data-bbox="269 798 833 1222" style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Adherence to TB Treatment (1)</b></p> <ul style="list-style-type: none"> <li>• <b>Most effective strategy to encourage adherence to treatment is DOT:</b> <ul style="list-style-type: none"> <li>- Should be used for <b>ALL patients, including children and adolescents</b></li> <li>- Should be done at a <b>time and place that is convenient for patients</b></li> </ul> </li> </ul>  <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 116</p> </div>	<ul style="list-style-type: none"> <li>- Explain that in order to cure TB and prevent drug resistance, TB patients must adhere to treatment</li> <li>- Explain that adherence to TB treatment can be difficult because patients need to take several different medications for many months</li> <li>- Review slide content</li> <li>- Ask participants what adherence problems they have encountered with patients and strategies they have used to overcome them</li> </ul> <p style="text-align: right;"><i>Adherence to TB Treatment – Module 4, p. 39</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 117</b></p>	<div data-bbox="269 1415 833 1839" style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Adherence to TB Treatment (2)</b></p> <ul style="list-style-type: none"> <li>• <b>Incentives and enablers can be used to improve patient adherence</b> <ul style="list-style-type: none"> <li>- Incentives are small rewards given to patient, e.g., gift cards</li> <li>- Enablers help patient receive treatment, e.g., bus tokens</li> </ul> </li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 117</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that incentives are small rewards given to patients to encourage them to take their medicines or keep DOT appointments</li> <li>- Explain that enablers help patients receive treatment</li> <li>- Mention that incentives and enablers are generally offered along with DOT</li> </ul> <p style="text-align: right;"><i>Adherence to TB Treatment – Module 4, p. 39</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 118</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="text-align: center;">Adherence to TB Treatment (3)</h3> <ul style="list-style-type: none"> <li>• Patients should be educated about TB disease and treatment           <ul style="list-style-type: none"> <li>– Cause of TB, transmission, diagnosis, and treatment plan</li> <li>– How to take medication</li> </ul> </li> </ul>  <p style="font-size: small; text-align: center;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 118</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Adherence to TB Treatment – Module 4, pp. 39-40</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 119</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="text-align: center;">Monitoring Patients' Adherence to Therapy</h3> <ul style="list-style-type: none"> <li>• Patients not receiving DOT should be monitored for adherence to treatment:           <ul style="list-style-type: none"> <li>– Check if patient is reporting to clinic</li> <li>– Ask about adherence</li> <li>– Ask patient to bring medications to clinic and count number of pills taken</li> <li>– Use urine tests to detect medication</li> <li>– Assess patient's clinical response to treatment</li> </ul> </li> </ul> <p style="font-size: small; text-align: center;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 119</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that none of these methods can be used to prove a patient took every dose of medication; the best way to ensure adherence to treatment is to use DOT</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Monitoring Adherence to Therapy – Module 4, p. 40</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 120</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="text-align: center;">Evaluating Patients' Response to Treatment (1)</h3> <p>Three methods to determine whether a patient is responding to treatment:</p> <ol style="list-style-type: none"> <li>1. Check to see if patient has TB symptoms (clinical evaluation)</li> <li>2. Conduct bacteriologic examination of sputum or other specimens</li> <li>3. Use chest x-rays to monitor patient's response to treatment</li> </ol> <p style="font-size: small; text-align: center;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 120</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Evaluating Patients' Response to Treatment – Module 4, p. 40</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 121</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Evaluating Patients' Response to Treatment (2)</b></p> <p><b>1. Check to see if patient has TB symptoms (clinical evaluation)</b></p> <ul style="list-style-type: none"> <li>• TB symptoms should gradually improve and go away after starting treatment</li> <li>• Patients whose symptoms do not improve during the first 2 months of treatment, or whose symptoms worsen after initial improvement, should be reevaluated</li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 121</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that although each patient responds to treatment at a different pace, all patients' TB symptoms should gradually improve</li> </ul> <p style="text-align: right;"><i>Evaluating Patients' Response to Treatment – Module 4, p. 40</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 122</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Evaluating Patients' Response to Treatment (3)</b></p> <p><b>2. Conduct bacteriologic examination of sputum or other specimens</b></p> <ul style="list-style-type: none"> <li>• Specimens should be examined every month until culture results have converted from positive to negative</li> <li>• Any patient whose culture results have not become negative after 2 months of treatment, or whose results become positive after being negative, should be reevaluated</li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 122</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right;"><i>Evaluating Patients' Response to Treatment – Module 4, p. 40</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 123</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Evaluating Patients' Response to Treatment (4)</b></p> <p><b>3. Use chest x-rays to monitor patient's response to treatment</b></p> <ul style="list-style-type: none"> <li>• Repeated x-rays are not as important as monthly bacteriologic and clinical evaluations</li> <li>• Chest x-rays taken at end of treatment can be compared to follow-up x-rays</li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 123</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that chest x-rays can be useful for patients who have negative culture results before treatment</li> </ul> <p style="text-align: right;"><i>Evaluating Patients' Response to Treatment – Module 4, p. 40</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 124</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="text-align: center;">Evaluating Patients' Response to Treatment (5)</h3> <ul style="list-style-type: none"> <li>• TST or IGRA <u>cannot</u> be used to determine whether patient is responding to treatment</li> <li>• Treatment completion is defined by number of doses patient takes within a specific time frame</li> <li>• Length of treatment depends on drugs used, drug susceptibility test results, and patient's response to therapy</li> </ul> <p style="font-size: small; text-align: center;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 124</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> <li>- Explain that most people who have a positive TST result will have a positive result again if they are skin tested later in their lives, regardless of whether they have received treatment</li> </ul> <p style="text-align: right; font-style: italic;">Evaluating Patients' Response to Treatment – Module 4, p. 41</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 125</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="text-align: center;">Reevaluating Patients Who Do Not Respond to Treatment (1)</h3> <ul style="list-style-type: none"> <li>• Reevaluating means repeating susceptibility tests and assessing whether patient has taken medication as prescribed</li> <li>• TB treatment can be complicated, especially in patients who: <ul style="list-style-type: none"> <li>– Fail to respond to treatment</li> <li>– Relapse</li> <li>– Have drug-resistant TB</li> <li>– Have serious adverse reactions to medications</li> </ul> </li> </ul> <p style="font-size: small; text-align: center;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 125</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; font-style: italic;">Reevaluating Patients Who Do Not Respond to Treatment – Module 4, p. 41</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 126</b></p>	<div style="border: 1px solid black; padding: 10px;"> <h3 style="text-align: center;">Reevaluating Patients Who Do Not Respond to Treatment (2)</h3> <ul style="list-style-type: none"> <li>• Patients should be reevaluated if: <ul style="list-style-type: none"> <li>– Symptoms do not improve in 2 months of therapy</li> <li>– Symptoms worsen after improving initially</li> <li>– Culture results have not become negative after 2 months of treatment</li> <li>– Culture results become positive after being negative</li> </ul> </li> </ul> <p style="font-size: small; text-align: center;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 126</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right; font-style: italic;">Reevaluating Patients Who Do Not Respond to Treatment – Module 4, p. 41</p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 127</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Adherence to Therapy Study Question 4.23</b></p> <p><b>Name 4 ways clinicians can assess whether a patient is adhering to treatment.</b> <i>(pg. 43)</i></p> <ul style="list-style-type: none"> <li>• Check whether patient is reporting to clinic as scheduled</li> <li>• Ask patient to bring medications to each clinic visit and count the number of pills</li> <li>• Use urine tests to detect medication</li> <li>• Assess patient's clinical response to therapy</li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 127</p> </div>	<ul style="list-style-type: none"> <li>- Introduce study questions</li> <li>- Ask participants to turn to p. 43 (if participants have print-based modules)</li> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 57</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 128</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Adherence to Therapy Study Question 4.24</b></p> <p><b>What is the best way to ensure that a patient adheres to treatment?</b> <i>(pg. 43)</i></p> <p style="text-align: center;"><b>Directly observed therapy (DOT)</b></p> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 128</p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 57</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 129</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Response to Treatment Study Question 4.25</b></p> <p><b>How can clinicians determine whether a patient is responding to treatment?</b> <i>(pg. 43)</i></p> <ul style="list-style-type: none"> <li>• Clinical evaluations</li> <li>• Bacteriologic evaluations</li> <li>• Chest x-rays</li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 129</p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 57</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 130</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Reevaluating the Patient Study Question 4.26</b></p> <p><b>Under what circumstances should patients be reevaluated?</b> <i>(pg. 43)</i></p> <ul style="list-style-type: none"> <li>• Symptoms do not improve during first 2 months of therapy</li> <li>• Symptoms worsen after improving initially</li> <li>• Culture results have not become negative after 2 months of treatment</li> <li>• Culture results become positive after being negative</li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 130</p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 57</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 131</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Reevaluating the Patient Study Question 4.27</b></p> <p><b>What does reevaluating the patient mean?</b> <i>(pg. 43)</i></p> <p style="padding-left: 20px;">Reevaluating the patient means checking for drug resistance by repeating the drug susceptibility tests and assessing whether the patient has been taking medication as prescribed.</p> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 131</p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 57</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 132</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Treatment of TB Disease</b></p> <hr style="width: 20%; margin: auto;"/> <p style="text-align: center;"><b>Role of Public Health Workers</b></p> <p style="text-align: right; font-size: small;">132</p> </div>	<ul style="list-style-type: none"> <li>- Introduce section</li> </ul>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 133</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p><b>Role of Public Health Workers (1)</b></p> <ul style="list-style-type: none"> <li>• <b>Successful TB treatment is the responsibility of medical providers and HCWs</b></li> <li>• <b>Case management can be used to ensure that patients complete TB treatment</b></li> <li>• <b>Elements of case management:</b> <ul style="list-style-type: none"> <li>– <b>Assign employee to manage patients</b></li> <li>– <b>Systematic routine review of patient's treatment progress</b></li> <li>– <b>Plans to address barriers to adherence</b></li> </ul> </li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 133</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right;"><i>Role of Public Health Workers – Module 4, p. 45</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 134</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p><b>Role of Public Health Workers (2)</b></p> <ul style="list-style-type: none"> <li>• <b>Provide DOT</b></li> <li>• <b>Help monitor patients' response to treatment</b></li> <li>• <b>Educate patients and families about TB</b></li> <li>• <b>Locate patients who have missed DOT visits or clinic appointments</b></li> <li>• <b>Act as interpreters, arrange and provide transportation for patients, and refer patients to other social services</b></li> <li>• <b>Work with private physicians to make sure TB patients complete an adequate regimen</b></li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 134</p> </div>	<ul style="list-style-type: none"> <li>- Review slide content</li> </ul> <p style="text-align: right;"><i>Role of Public Health Workers – Module 4, p. 45</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 135</b></p>	<div style="border: 1px solid black; padding: 10px;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p><b>Role of Public Health Workers Study Question 4.28</b></p> </div> <p><b>What are the three elements of case management?</b> <i>(pg. 47)</i></p> <ul style="list-style-type: none"> <li>• <b>Assignment of employee to manage specific patients</b></li> <li>• <b>Systematic review of each patient's treatment progress</b></li> <li>• <b>Plans to address barriers to adherence</b></li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 135</p> </div>	<ul style="list-style-type: none"> <li>- Introduce study questions</li> <li>- Ask participants to turn to p. 47 (if participants have print-based modules)</li> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 58</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 136</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Role of Public Health Workers Study Question 4.29</b></p> <p>What should a public health worker do if he or she notices that a patient has symptoms of an adverse reaction? (pg. 47)</p> <ul style="list-style-type: none"> <li>• Instruct patient to stop taking medication if symptoms are serious</li> <li>• Report situation to clinician and arrange medical evaluation</li> <li>• Note symptoms in patient's record</li> </ul> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 136</p> </div>	<ul style="list-style-type: none"> <li>- Read question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 58</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 137</b></p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <h2 style="margin: 0;">Case Studies</h2> <hr style="width: 20%; margin: 10px auto;"/> <p style="font-size: small; margin-top: 20px;">137</p> </div>	<ul style="list-style-type: none"> <li>- Introduce case studies</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 138</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Case Study 4.1 (1)</b></p> <p>You are sent to visit the home a TB patient who was admitted to the hospital last week and diagnosed with infectious TB disease. Living in the home are his wife and his 1-year-old daughter. Neither one has symptoms of TB disease. You give them both a TST and return 2 days later to read the results. You find that the wife has 14 mm of induration, but the daughter has no induration. (pg. 16)</p> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 138</p> </div>	<ul style="list-style-type: none"> <li>- Ask participants to turn to p. 16 (if participants have print-based modules)</li> <li>- Read case study</li> </ul> <p style="text-align: right;"><i>Case Study 4.1 – Module 4, p. 16</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 139</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Case Study 4.1 (2)</b></p> <p><b>Should either one start LTBI treatment?</b></p> <p style="text-align: center;">Yes, both should start LTBI treatment.</p> </div> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 139</p>	<ul style="list-style-type: none"> <li>- Read case study question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Answers – Module 4, p. 59</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 140</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Case Study 4.1 (3)</b></p> <p><b>Why or why not?</b></p> <p>The wife is a close contact of someone with infectious TB disease and she has a positive skin test. She should complete an entire course of LTBI treatment, regardless of her age, after receiving a medical evaluation.</p> </div> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 140</p>	<ul style="list-style-type: none"> <li>- Ask participants why the wife should receive LTBI treatment</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Answers – Module 4, p. 59</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 141</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Case Study 4.1 (4)</b></p> <p><b>Why or why not? (cont.)</b></p> <p>The daughter is also a close contact. She currently has a negative skin test, but only one week has passed since her last TB exposure. It is possible the TST reaction may be false-negative.</p> <p>Since it is currently impossible to tell whether she has TB infection and because she may develop TB disease very quickly after infection, she should start LTBI treatment now and be retested 8-10 weeks after last exposure to TB. If negative, she may stop taking medicine. If positive, she should complete the entire course of LTBI treatment (9 months for children).</p> </div> <p style="font-size: small; margin-top: 5px;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 141</p>	<ul style="list-style-type: none"> <li>- Ask participants why the daughter should receive LTBI treatment</li> </ul> <p style="text-align: right; margin-top: 20px;"><i>Answers – Module 4, p. 59</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 142</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Case Study 4.2 (1)</b></p> <p>A 65-year-old man is prescribed INH LTBI treatment because he is a close contact of a person with infectious TB and he has an induration of 20 mm in reaction to the tuberculin skin test. His baseline liver function tests are normal, but he drinks a six-pack of beer every day. (pg. 22)</p> <p style="font-size: small; text-align: center;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 142</p> </div>	<ul style="list-style-type: none"> <li>- Ask participants to turn to p. 22 (if participants have print-based modules)</li> <li>- Read case study</li> </ul> <p style="text-align: right;"><i>Case Study 4.2 – Module 4, p. 22</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 143</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Case Study 4.2 (2)</b></p> <p>What kind of monitoring is necessary for this patient while he is taking INH?</p> <ul style="list-style-type: none"> <li>• Although his liver function tests are normal, he is at high risk of INH-associated hepatitis because he is older than 35 and abuses alcohol.</li> <li>• He should be educated about the symptoms of adverse reactions to INH and be instructed to seek medical attention immediately if these symptoms occur.</li> <li>• He should be seen by a clinician monthly to ask about his symptoms, examine him for signs of adverse reactions, and consider performing liver function tests.</li> </ul> <p style="font-size: small; text-align: center;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 143</p> </div>	<ul style="list-style-type: none"> <li>- Read case study question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 60</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 144</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Case Study 4.3 (1)</b></p> <p>An 18-month-old girl is admitted to the hospital because of meningitis. Doctors discover that her grandmother had pulmonary TB and was treated with a 6-month regimen. The medical evaluation of the child confirms the diagnosis of TB meningitis. (pg. 33)</p> <p style="font-size: small; text-align: center;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 144</p> </div>	<ul style="list-style-type: none"> <li>- Ask participants to turn to p. 33 (if participants have print-based modules)</li> <li>- Read case study</li> </ul> <p style="text-align: right;"><i>Case Study 4.3 – Module 4, p. 33</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 145</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Case Study 4.3 (2)</b></p> <p><b>How long should the child be treated?</b></p> <p style="text-align: center;">Infants and children with miliary TB, bone and joint TB, or TB meningitis should be treated for 12 months.</p> <p style="font-size: small; text-align: center;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 145</p> </div>	<ul style="list-style-type: none"> <li>- Read case study question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 60</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 146</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Case Study 4.4 (1)</b></p> <p>You are assigned to deliver medications to TB patients as part of the DOT program where you work. When you visit Mr. Jackson’s house, you ask him how he is feeling. He tells you that he was up all night vomiting. <i>(pg. 38)</i></p> <p style="font-size: small; text-align: center;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 146</p> </div>	<ul style="list-style-type: none"> <li>- Ask participants to turn to p. 38 (if participants have print-based modules)</li> <li>- Read case study</li> </ul> <p style="text-align: right;"><i>Case Study 4.4 – Module 4, p. 38</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 147</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Case Study 4.4 (2)</b></p> <p><b>What are the possible causes?</b></p> <p style="text-align: center;">His vomiting may be a symptom of hepatitis (caused by INH, RIF, and PZA) or of stomach upset due to PZA. Mr. Jackson should be advised to stop his medication and the situation should be reported to the clinician immediately. Mr. Jackson should be given a medical evaluation right away.</p> <p style="font-size: small; text-align: center;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 147</p> </div>	<ul style="list-style-type: none"> <li>- Read case study question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 60</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 148</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Case Study 4.5 (1)</b></p> <p>Ms. Young, a patient who started treatment for TB disease last week, calls the TB clinic to complain that her urine has changed to a funny color. <i>(pg. 38)</i></p> <p style="font-size: small; text-align: center;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 148</p> </div>	<ul style="list-style-type: none"> <li>- Read case study</li> </ul> <p style="text-align: right;"><i>Case Study 4.5 – Module 4, p. 38</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 149</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Case Study 4.5 (2)</b></p> <p>Name 2 possible causes, and explain how each would affect the color of the urine.</p> <p style="font-size: small;">One possible cause is the discoloration of body fluids, a common side effect of RIF. This would cause Ms. Young’s urine to turn orange. This is NOT a serious condition.</p> <p style="font-size: small;">Another possible cause is hepatitis, which can be caused by INH, RIF, or PZA. Hepatitis, a serious condition, would cause Ms. Young’s urine to turn dark. If Ms. Young’s urine is dark, the situation should be reported to the clinician and Ms. Young should receive a medical evaluation right away.</p> <p style="font-size: small; text-align: center;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 149</p> </div>	<ul style="list-style-type: none"> <li>- Read case study question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 61</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 150</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Case Study 4.6 (1)</b></p> <p>Mr. Vigo was diagnosed with smear-positive pulmonary TB in January. He was treated with INH, RIF, and PZA by his private physician. He visited his physician again in March. His drug susceptibility test results were not available at the time of this appointment. Nevertheless, the physician discontinued his prescription of PZA and gave him refills of INH and RIF. Mr. Vigo visited his physician again in April. He had a persistent cough, and his sputum smear was found to be positive. <i>(pg. 44)</i></p> <p style="font-size: small; text-align: center;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 150</p> </div>	<ul style="list-style-type: none"> <li>- Ask participants to turn to p. 44 (if participants have print-based modules)</li> <li>- Read case study</li> </ul> <p style="text-align: right;"><i>Case Study 4.6 – Module 4, p. 44</i></p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 151</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Case Study 4.6 (2)</b></p> <p><b>What should be done next?</b></p> <p>Mr. Vigo's persistent cough and positive sputum smear indicate that he is not responding to therapy. The most likely explanations are:</p> <ul style="list-style-type: none"> <li>• He is not taking his medication as prescribed</li> <li>• He has drug-resistant TB and the regimen he has been prescribed is not adequate to treat his TB</li> <li>• A combination of the two factors listed above</li> </ul> <p>The initial drug susceptibility test results should be located, and susceptibility tests should be repeated on a recent sputum specimen. In addition, his adherence should be evaluated, and he should be given DOT if possible.</p> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 151</p> </div>	<ul style="list-style-type: none"> <li>- Read case study question</li> <li>- Ask participants for answers</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 61</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 152</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Case Study 4.7 (1)</b></p> <p>Ms. DeVonne began treatment for pulmonary TB disease 2 months ago, at the beginning of September. You have been giving her DOT. During the first few weeks of therapy, you noticed that Ms. DeVonne's symptoms were improving a little. However, at a visit in October, you see that Ms. DeVonne is coughing up blood, and she tells you that she feels like she has a fever. (pg. 48)</p> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 152</p> </div>	<ul style="list-style-type: none"> <li>- Ask participants to turn to p. 48 (if participants have print-based modules)</li> <li>- Read case study</li> </ul> <p style="text-align: right;"><i>Case Study 4.7 – Module 4, p. 48</i></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Slide 153</b></p>	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Module 4: Case Study 4.7 (2)</b></p> <p><b>What should you do?</b></p> <p>Coughing up blood and feeling feverish are symptoms of TB disease. You should report Ms. DeVonne's symptoms to the clinician and arrange for her to receive a medical evaluation. Note her symptoms in her record.</p> <p>Symptoms becoming worse after improving initially indicates that she is not responding to therapy. Because she is receiving DOT, Ms. DeVonne is probably taking her medications as prescribed. Therefore, the most likely explanation is that she has drug-resistant TB.</p> <p>Ms. DeVonne's initial drug susceptibility test results should be located, and drug susceptibility tests should be repeated.</p> <p style="font-size: small;">Module 4 – Treatment of Latent Tuberculosis Infection and Tuberculosis Disease 153</p> </div>	<ul style="list-style-type: none"> <li>- Read case study question</li> <li>- Ask participants for answers</li> <li>- Ask if there are any questions about Module 4 before moving on to Module 5</li> </ul> <p style="text-align: right;"><i>Answers – Module 4, p. 62</i></p>