BACKGROUND

HIV and tuberculosis (TB) are both dangerous diseases, but they are especially deadly together. People living with HIV are much more likely to get TB, have more severe TB when they get it, and are harder to diagnose since their TB is more often extrapulmonary, or atypical. TB also worsens HIV, resulting in more rapid deterioration and death. Effective strategies exist to break this deadly cycle. Antiretroviral therapy (ART) reduces HIV-positive patients’ vulnerability to TB and improves outcomes of TB treatment. But ART alone is not enough. Clinicians must be familiar with the particular challenges of TB management in HIV-positive patients and, in particular, know when to treat empirically for TB on clinical grounds without undue delay.

GOAL OF THE UNIT

In this unit, you will learn how to diagnose and treat TB in HIV-positive adult patients. You will review the initial management of TB in both ambulatory and severely ill HIV-positive patients using clinical algorithms and cases. You will learn how to arrive at a clinical diagnosis of smear-negative or extrapulmonary TB within 3-5 days so that prompt, life-saving TB treatment can be initiated. The more complicated problems of extrapulmonary and drug-resistant TB will also be introduced. In addition to diagnosis and treatment, you will learn about the other key components to comprehensive management of TB/HIV care: daily accompaniment and adherence support, active case-finding, infection control, and patient education. Successful implementation of the strategies covered in this unit will save lives and reduce transmission of TB.

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**GENERAL OBJECTIVES**

By the end of the unit, you will be able to:

1. Explain why TB is such a serious disease for HIV-positive patients.
2. Apply the human rights approach to comprehensive TB/HIV care in practice.
3. Manage suspected TB in ambulatory HIV-positive patients who do not have danger signs.
4. Manage suspected TB in seriously ill HIV-positive patients.
5. Educate patients on important aspects of TB care.
6. Practice good TB infection control in the clinic.
7. Explain the basic principles of extrapulmonary TB.
8. Explain the basic principles of drug-resistant TB.

When you see this icon, check the information to make sure it is up to date.

(This includes all protocols, algorithms, treatments, and statistics which are subject to change.)
PART 1: Review of Epidemiology

Diagnosis and treatment of TB is an important part of caring for patients living with HIV.

- People with HIV are much more likely to get TB.
- People with HIV have more severe TB when they get it.
- TB worsens HIV, resulting in more rapid deterioration and death.
- More HIV-positive people die from TB in Africa than from any other cause.

To fight the deadly combination of TB and HIV:
- Screen your HIV patients for TB at every visit.
- Every time you make a new diagnosis of TB, test for HIV.
- Implement infection control measures to prevent the transmission of TB to vulnerable HIV patients.
- Know how to diagnose and treat TB and HIV.
- Know when to start empirical TB treatment for suspected smear-negative or extrapulmonary TB because delayed treatment results in lives lost.
- Know how to refer patients for nutrition and housing services.
- Know how to educate patients about TB and HIV co-infection and care.
- For diagnosed TB patients, test family members and close contacts for TB and HIV.

Epidemiology of TB/HIV co-infection:
- TB is the most common presenting illness among people living with HIV taking antiretroviral treatment.
- TB is the leading cause of death among people living with HIV in Africa.
- In Rwanda, 39,000 new cases of TB were reported in 2007 – 37% of them were in HIV-positive persons.

UNIT 3 – Comprehensive Approach to the Management of TB/HIV Co-Infection in Adults

KEY POINTS

1. TB is very common in HIV-positive patients.
2. Diagnosis and treatment of TB in HIV-positive patients is an important part of clinicians’ work.
TB is a disease of poverty. To break the cycle of transmission, you cannot only treat the disease but must also address the root causes of patients’ health problems: lack of basic human rights.
UNIT 3 – Comprehensive Approach to the Management of TB/HIV Co-Infection in Adults

Crowding

Poor Ventilation

Malnutrition
UNIT 3 – Comprehensive Approach to the Management of TB/HIV Co-Infection in Adults

Distance From Clinic

Stigma and Discrimination
Inadequate Housing: Crowding and Poor Ventilation
People lack basic human rights when they do not have access to adequate housing and economic opportunities that permit people to support themselves and their families. Inadequate housing conditions, including crowded conditions and poor ventilation, enable TB bacteria to pass easily from person to person. The Program on Social and Economic Rights (POSER) upholds the right of the poor to safe, sturdy housing. Rehabilitation, renovation, and construction of houses are prioritized for patients whose medical and economic needs are greatest. POSER also teaches skills, such as construction and sewing, to patients so they can generate income and create a better life for themselves and for their families.

Malnutrition
Malnutrition weakens the immune system, making people more susceptible to disease. Malnutrition represents a lack of access to adequate nutrition and economic opportunities that permit patients to support themselves and their families, which are basic human rights. At community sites, food packages and nutritional support are offered to patients showing signs of malnutrition or starting tuberculosis treatment. POSER also encourages working with partners in the community to start agricultural projects and teach farming methods.

Distance From the Clinic
Patients who need to walk long distances or pay high transportation costs to get to a health clinic are less likely to utilize health services than those who live closer. By delaying treatment for their TB, they continue to pass it on to others. These barriers represent a lack of access to medical care, which is a basic human right. Eliminating barriers to accessing health care by paying transportation costs, or bringing health care to the patient’s doorstep via community health workers and home visits are some ways we can ensure that patients’ right to health and medical care is upheld.

ACTIVITY

Task: After dividing into small groups, choose a group representative who will present your group’s work.

Discuss the image you have been assigned using the following questions:

1. How does the situation in this image make a person more susceptible to TB?
2. How are these conditions related to a lack of human rights?
3. What support services could address the conditions shown on the image?
Stigma and Discrimination
Stigma and discrimination make people with TB less likely to inform others about their disease or go to clinic, and more likely to continue to pass it on to others. These conditions affect patients’ complete health and well being, which is a human right. Effective treatment decreases stigma and discrimination by showing patients and the community that TB can be cured. Community health workers model compassionate behavior and educate the community about the disease.

Medication alone will not cure TB when other issues, such as crowded, poorly ventilated housing, malnutrition, barriers to accessing health care, and stigma and discrimination exist. Comprehensive care should therefore include support services that address the lack of access to adequate housing, food, and economic opportunities as well as stigma and discrimination - conditions that make TB and poverty such a deadly combination.

Comprehensive Approach to the Management of TB/HIV Co-infection
People living with HIV are much more likely to get TB, and HIV and TB are especially deadly together. The comprehensive approach to the management of TB/HIV co-infection addresses this issue by ensuring that TB and HIV care are integrated. In addition to diagnosis and treatment, other key components to comprehensive management of TB/HIV care include:

1. Integrated treatment of TB/HIV co-infection
2. Daily accompaniment and adherence support
3. Nutritional and other necessary social support
4. Active case-finding, including home visits
5. Infection control
6. Patient education

**KEY POINTS**

1. TB is a disease of poverty. To break the cycle of transmission, you cannot only treat the disease but you must also address the root causes of patients’ health problems: lack of basic human rights.

2. The comprehensive approach to the management of TB/HIV co-infection includes the following components:
   - Integrated treatment of TB/HIV co-infection
   - Daily accompaniment and adherence support
   - Nutritional and other necessary social support
   - Active case-finding, including home visits
   - Infection control
   - Patient education
Daily Accompaniment and Adherence Support, Nutritional and Other Social Support

Community health workers provide a vital link between the patient and the clinic. All community health workers who work with HIV-positive patients are also trained to work with TB patients and those co-infected with HIV and TB.

**ROLE PLAY**

**Scenario**

A community health worker is visiting a TB patient who has been taking her TB medication for four months. The community health worker gives the patient her medicines and watches her take them. The community health worker asks her if she has any side effects such as difficulty breathing, chest pain, rashes, vomiting or nausea, trouble swallowing, jaundice, swollen eyes or tongue, changes in vision, or hearing loss. The patient answers no to all but she says that she is feeling better and she wants to stop taking her medicine. She does not like swallowing pills. The community health worker explains to the patient that it is important to continue taking her medicine even though she feels better; she is not cured yet. If she stops treatment, the symptoms will come back. The community health worker tries to understand the patient’s concerns and offer support.

The community health worker also asks the patient how things are going, how is her husband, how are the children. The patient responds that her husband lost his job. She is worried that they will not be able to pay her children’s school fees. The community health worker reassures the patient that s/he will tell the social worker about the change in situation and ask about support for children’s schooling. S/he will make sure the patient comes in to talk to the social worker about this.

Community health workers pick up patients’ medicines from the pharmacy, bring patients their anti-TB medicines, and watch as they take them. Distributing and watching patients take their medication is called Directly Observed Therapy, or DOT. By doing DOT, community health workers ensure adherence, prevent the development of resistance to drugs, and increase patients’ chances of being cured.

Community health workers encourage patients to keep taking their medicines and educate them about why they need to continue treatment despite a lack of symptoms. They also educate patients, check for urgent side effects, offer psychological support, look for changes in economic conditions and explain how to get social support.

Community health workers also perform active case-finding. This means that they make sure that those living with the patient go to the clinic to be tested for TB and actively look for people with TB symptoms in the community and refer them to the clinic to be tested.
Daily accompaniment and adherence support is an important component of the comprehensive approach to the management of TB/HIV co-infection, and community health workers play a central role in providing these services.

**Nutritional and Other Social Support**

Nutritional and other necessary social support is another important element in the comprehensive approach to the management of TB/HIV co-infection. Malnutrition is a fairly common problem in HIV/AIDS and TB patient populations.

Malnutrition weakens the immune system and lowers the patient’s ability to fight TB, even with TB drugs. Because health and good nutrition are so intertwined, TB/HIV co-infected patients are offered nutritional support for 6 months after TB is diagnosed. Patients with a Body Mass Index below 18.5 also receive nutritional support for 6 months.

Social support such as adequate housing, help with school fees, vocational training, are available to TB/HIV co-infected patients. The social worker usually evaluates a patient’s eligibility for these support services.

Comprehensive management of TB/HIV co-infection requires teamwork. The community health workers provide daily accompaniment and adherence support and play a crucial role in other components of the comprehensive approach, such as active-case finding, infection control, and patient education. The social workers provide nutritional and other social support and educate patients. Clinicians must work very closely with the community health workers and the social workers to provide comprehensive care to patients.

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**KEY POINTS**

1. Daily accompaniment and adherence support as well as nutritional and other social support are essential elements of the comprehensive approach to the management of TB/HIV care.

2. Providing comprehensive care for TB/HIV co-infection requires teamwork. Community health workers and social workers play an important role in this model of care.
Active Case-Finding

Active case-finding reduces the spread of TB. Active case-finding means actively searching for, identifying and testing all persons in the community with TB symptoms and actively tracing all persons living in the same household or coming into close contact with a patient diagnosed with TB. This is in contrast to “passive case-finding.” In passive case-finding, health providers wait for community members to come to them once they present symptoms.

Active case-finding is an effective way of breaking the chain of TB transmission in the community. TB is highly contagious. One TB patient may infect many others, especially those who are vulnerable such as children, the elderly and those who are immunosuppressed or malnourished. Community and household visits to identify TB patients who might not otherwise come to the clinic are critically important.

Each member of the clinical team plays a role in active case-finding. Community health workers refer household members and close contacts to the health center for testing. They also search actively for people with TB symptoms during household visits; Clinicians ask TB patients to bring their household members to the clinic.

There are challenges to doing active case-finding. It is difficult to get people to come to the clinic to get tested because of fear of stigma, costs, lack of transportation, their inability to miss work. It is difficult for clinicians to follow up with a patient’s contacts because of lack of time or staff.

To improve active case-finding at your clinic, encourage patients to bring in their household members. Work as a team – the clinicians, the social workers and community health workers – to make sure each patient’s contacts have been identified and tested; conduct a home visit for TB patients.

**KEY POINTS**

1. Active case-finding helps break the cycle of TB transmission.

2. Clinicians, community health workers and social workers all play a role in active case-finding in the community. They must work together as a team.
Infection Control

TB is transmitted through the air, via droplets. When people who are infectious (i.e., contagious) with TB sneeze, cough, or even laugh, they expel small droplets into the air that contain *Mycobacterium tuberculosis*, the bacterium that causes TB. Other people who inhale these droplets are then at risk of developing TB. TB spreads easily. There are many infection control measures that can help to reduce TB transmission.

**Infection Control Measures for Clinics**

**A. Infection control measures for patients**
- **Separate infectious TB patients from other patients:**
  - Place TB patients in a separate waiting area or have an outdoor waiting area.
  - If possible, see TB patients first to avoid long periods in the waiting room.
  - Make sure that both outpatient exam rooms and hospital areas are well-ventilated.
  - Put hospitalized TB patients in a separate ward if possible.
  - Collect sputum samples outside of the health center.
- **Teach TB patients cough etiquette:** Patients must cover their mouth when coughing or sneezing.

**B. Infection control measures for the staff**
- **Wear an N95 mask:** Clinicians and anyone working with infectious TB patients (or status unknown) must always wear N95 masks to prevent infection.
- **Know your status:** Health care workers who care for TB patients should routinely have themselves tested for TB. Health care workers who are living with HIV may need to take special preventive treatment for TB.

**C. Infection control measures for everyone**
- **Early detection and diagnosis:** Screen all HIV patients for TB. Conduct active case-finding for household members or contacts of diagnosed TB patients; conduct active case-finding in the community in general.
- **Effective treatment:** Early detection and effective treatment of TB are the best ways to prevent TB transmission. Assure adherence to full course of medication with daily community health worker visits and nutritional and other social support.

**N95 Mask**

Wearing a mask when treating infectious TB patients is very important to ensure that you do not contract TB. Your airway and lungs must be protected from air that might contain TB bacteria. Wear the right kind of mask: it must provide adequate protection. The N95 mask is made of a sturdy material that filters air as you breathe through it and does not allow the bacteria to pass. Also, the N95 mask is made to fit over your mouth and nose tightly, with a metal clamp on the nose and two elastic straps, so that air cannot leak in around the mask. The surgical mask does have these important features. An N95 mask protects you against TB and a surgical mask does not.
ACTIVITY

Task: Discuss your illustration using these questions:

- What is happening in the illustration?
- What good infection control practices are shown?
- What problems with infection control are shown? Why are they problems?
- How could infection control be improved in this situation?

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Scenario A

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Scenario B
Task: Discuss your illustration using these questions:

- What is happening in the illustration?
- What good infection control practices are shown?
- What problems with infection control are shown?
  Why are they problems?
- How could infection control be improved in this situation?

Scenario C

Scenario D
**Task:** Discuss your illustration using these questions:

- What is happening in the illustration?
- What good infection control practices are shown?
- What problems with infection control are shown?
  - Why are they problems?
- How could infection control be improved in this situation?

**KEY POINT**

Infection control measures include:

- Separate infectious TB patients from others in clinic
- Teach TB patients cough etiquette
- Wear an N95 mask
- Know your status
- Early detection and diagnosis
- Effective treatment
UNIT 3 – Comprehensive Approach to the Management of TB/HIV Co-Infection in Adults

PART 3

Management of Suspected TB in Ambulatory HIV-Positive Patients

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Algorithm for the Management of Suspected TB in Ambulatory HIV-Positive Patients

At every visit with each HIV-positive patient*

1. Screen for TB: cough > 2 weeks, fever, night sweats, weight loss, close contact with a TB patient
2. Check for danger signs: Temp > 39°C, HR > 120 beats/min, RR > 30 breaths/min, needs help walking
3. Detailed clinical exams for findings such as lymphadenopathy and hepatosplenomegaly

*If HIV status unknown – perform HIV test

TB suspected (one or more signs/symptoms present) + No danger signs

1. Sputum smear microscopy x 3
2. CD4 cell count
3. Chest x-ray

All negative sputum smears and chest x-ray findings NOT suggestive of TB

Start oral antibiotics for bacterial pneumonia
Consider PCP treatment if severe shortness of breath and/or, hypoxia (oxygen saturation <90 at rest at room air), CD4 cell count <200, chest x-ray suggestive of PCP

Clinical improvement after 3-5 days of oral antibiotics (+/- PCP treatment)?

Yes
Complete course of antibiotics

No
Repeat sputum smear microscopy x 3
Consider alternate diagnoses:
1. non-TB lung disease
2. smear negative or extrapulmonary TB

One or more positive sputum smears and/or clinical exam and/or chest x-ray findings suggestive of TB

Integrated Treatment of TB/HIV Co-Infection
1. Start anti-TB treatment
2. Start or adjust ART if eligible
3. Start or continue cotrimoxazole
4. Provide daily accompaniment and adherence support (directly observed treatment)
5. Provide nutritional support and other social support
6. Active case-finding
7. Patient education

Follow-Up Care
1. Refer for or continue routine HIV care
2. Monitor effect of anti-TB treatment (in co-infected patients, this is integrated into routine HIV care)
3. Manage side effects
4. Continue adherence support, nutritional and other social support
5. Patient education

All smears negative and low clinical suspicion for TB

Refer for or continue routine HIV care

UNIT 3 – Comprehensive Approach to the Management of TB/HIV Co-Infection in Adults

Below, clinical algorithms are presented to help guide you in diagnosing and treating patients. These algorithms are useful in everyday practice as they tell us what to do, the order in which to do it, and what choices to make based on the information received. In this unit, you will learn how to use the algorithm for suspected TB in ambulatory HIV-positive patients. Clinical algorithms may change over time, and may vary based on location or institution, so check the algorithms in use in your clinic, and ask an experienced clinician if unsure.

As shown in the first step in the algorithm, clinicians must screen HIV-positive patients for TB at every visit and check for danger signs. Patients diagnosed with TB but with an unknown HIV status should always be offered HIV testing.

**When screening for TB, ask whether the patient has:**
- had a cough for more than three weeks
- a fever
- night sweats
- weight loss, or
- close contact with a TB patient or someone suspected of having TB.

These questions must be asked during the initial medical evaluation and at every follow-up visit thereafter. If the patient answers “yes” to any of these questions, s/he should be tested for TB.

TB screening questions are written on the Enrollment Form that clinicians fill out at the initial medical evaluation. TB screening is also referenced on the Follow-up Form.

Danger signs indicate that a patient is seriously ill. The first clinical decision to make when evaluating patients is whether they are seriously ill and need urgent care; in those cases, it is more appropriate to use the “Suspected TB in Seriously Ill HIV-Positive Patients” algorithm, which is on page 44.

**The danger signs to look for are:**
- Temperature > 39˚C
- Heart rate > 120 beats/min
- Respiration rate > 30 breaths/min
- Unable to walk without help

If an HIV-positive patient is suspected of having TB, but has no danger signs, the next step is to order the following tests:
1. Sputum smear microscopy x 3
2. CD4 cell count
3. Chest x-ray (transfer to district hospital for chest x-ray if needed.)
Sputum smear microscopy is a test of sputum that allows identification of *Mycobacteria tuberculosis*, the bacterium that causes TB. A positive smear indicates that the patient has pulmonary TB and is infectious. Negative smears do not exclude TB.

Ideally, try to do three early morning sputum samples on separate days to find TB bacteria. It is okay to collect 3 samples on the same day if it is a hardship for the patient to come and go from clinic. Try to get at least one sample in the early morning.

**To insure that you collect a good sputum sample:**
- Early morning is best time for taking sputum samples
- Deep cough helps ensure good samples
- If available in your clinic, ‘induction’ – patient inhaling nebulized saline to irritate lungs and stimulate deep cough – helps ensure good samples

**Also remember when collecting sputum samples:**
- Collect samples outdoors to reduce transmission to other patients and staff
- Wear an N-95 mask
- Seal samples properly and make sure the collection cup is well identified with the patient identification information
- Bring the sample to the lab immediately

The chest x-ray plays an important role in the diagnosis of TB in HIV-positive patients. Because smear-negative pulmonary TB – pulmonary TB that is present despite negative sputum smear microscopy – is more common in HIV-positive patients, the chest x-ray helps identify a percentage of patients who are sputum smear negative but still have pulmonary TB by revealing abnormalities on their chest x-ray. Without a chest x-ray, TB treatment in these patients would likely have been delayed.

Interpretation of chest x-rays is beyond the scope of this training. For smear-negative patients, you must always consult a colleague with experience in chest x-ray interpretation before taking any treatment decisions.

The Ministry of Health in Rwanda recommends that HIV/TB co-infected patients should begin ART if: [WHO clinical stage 1, 2, 3 and CD4 <500] OR [WHO clinical stage 4, regardless of CD4 count]. The CD4 cell count also acts as a pre-ART baseline measurement if the patient is starting ART for the first time.
CASE STUDIES

Task: Read the two cases and the case questions:

- What is the difference between these two patients?
- Would you approach these patients differently? If yes, how?

Case Study #1
Olive is a 33-year-old HIV-positive woman whom you have been following in the HIV clinic for 1 year. Her previous CD4 counts have been above 350 cells/mm³, so she has not been started on ART. Today, during a routine visit, she complains of having had a cough for the past 4 weeks. She denies having any other symptoms. On physical exam, her temperature is 37°C, her heart rate is 90/minute, and her respiratory rate is 20/minute. She can walk without any help.

Case Study #2
Faustin is a 39-year-old HIV-positive man whom you have been following in the HIV clinic for the past 4 months. He takes AZT, 3TC, NVP, and cotrimoxazole prophylaxis. Today, during a routine visit, he complains of coughing for the past 4 weeks and coughing up blood for the past eight days. He also complains of shortness of breath and generalized weakness. He thinks he has had fevers but denies any night sweats. A physical exam indicates that his temperature is 39°C, his heart rate is 120 beats/minute, his respiratory rate is 32 breathes/minute.

Case questions:

- What is the difference between these two patients?

_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

- Would you approach these patients differently? If yes, how?

_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
KEY POINTS

1. Clinicians must screen HIV-positive patients for TB at every visit and any patient suspected of having TB must be tested for HIV.

2. HIV-positive patients suspected of having TB should be screened for danger signs to determine how to proceed with treatment.

3. HIV-positive patients with no danger signs suspected of having TB should have the following diagnostic tests:
   - Sputum smear microscopy x 3, at least one during the early morning
   - CD4 cell count
   - Chest x-ray

Management of Patients With One or More Positive Sputum Smears and/or Chest X-ray Findings Suggestive of TB

The right side of the algorithm shows how to manage patients with one or more positive sputum smears or chest x-ray findings suggestive of TB. It is expected that these algorithms will change over time and may vary based on country. Check these algorithms against your clinic’s current regimens and ask an experienced clinician for help if you are not sure. Even if these algorithms are not the same as the algorithms in use at your clinic, reviewing this algorithm will help you understand what to expect from the algorithm and treatment regimens for TB.

HIV-positive patients are diagnosed with pulmonary TB if they have one or more positive sputum smears and/or chest-x-ray findings suggestive of TB. If patients meet these criteria, they should receive the following treatment: start anti-TB treatment; start ART if eligible or adjust the regimen if the patient is already on ART; start or continue cotrimoxazole prophylaxis; daily accompaniment and adherence support, nutritional and other social support, active case-finding and patient education.

The first component to treating HIV-positive patients with TB is starting anti-TB treatment.
Anti-TB Treatment Regimens

<table>
<thead>
<tr>
<th>PATIENT CATEGORY</th>
<th>TREATMENT SCHEDULE</th>
<th></th>
<th>CONTINUATION PHASE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New case</strong></td>
<td></td>
<td>INTENSIVE PHASE</td>
<td>CONTINUATION PHASE</td>
</tr>
<tr>
<td>• Patient who has never been treated</td>
<td>2 months:</td>
<td></td>
<td>4 months:</td>
</tr>
<tr>
<td>for TB in the past, or has taken</td>
<td>• Isoniazid (H)</td>
<td></td>
<td>• Isoniazid (H)</td>
</tr>
<tr>
<td>anti-TB drugs for less than 1 month.</td>
<td>• Rifampicin (R)</td>
<td></td>
<td>• Rifampicin (R)</td>
</tr>
<tr>
<td>• May be smear positive or negative.</td>
<td>• Pyrazinamide (Z)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ethambutol (E)</td>
<td></td>
<td></td>
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<tr>
<td><strong>Previously treated case</strong></td>
<td>2 months:</td>
<td>5 months:</td>
<td></td>
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<tr>
<td>• Patient who has received 1 month</td>
<td>• Streptomycin (S)</td>
<td></td>
<td>• Isoniazid (H)</td>
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<td>or more of anti-TB drugs in the past</td>
<td>• Isoniazid (H)</td>
<td></td>
<td>• Rifampicin (R)</td>
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<tr>
<td>with one of the following outcomes:</td>
<td>• Rifampicin (R)</td>
<td></td>
<td>• Ethambutol (E)</td>
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<tr>
<td>cured/treatment completed (^a)^ or</td>
<td>• Pyrazinamide (Z)</td>
<td></td>
<td></td>
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<tr>
<td>defaulted(^c).</td>
<td>• Ethambutol (E)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• MDR-TB not suspected.</td>
<td>Followed by 1 month:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• May be smear positive or negative.</td>
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<td></td>
<td>• Rifampicin (R)</td>
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<td></td>
<td>• Pyrazinamide (Z)</td>
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<td>• Ethambutol (E)</td>
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<td>**Patients demonstrating treatment</td>
<td>Specialized treatment is indicated. Consult a TB expert.</td>
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<td>failure(^d) to previous treatment, or</td>
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<tr>
<td>in whom MDR-TB is either documented or</td>
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<td>strongly suspected.</td>
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\(^a\)Cured: A patient whose sputum smear or culture was positive at the beginning of treatment who is smear-negative in the last month of treatment and on at least one previous occasion.

\(^b\)Treatment completed: A patient who completed treatment but who does not have a negative sputum smear or culture result in the last month of treatment and on at least one previous occasion (smear-positive patient at beginning of treatment who has completed treatment but smear results not available at end of treatment; smear-negative patient at beginning of treatment who has completed treatment, was smear-negative at end of initial phase but no smear control at end of treatment; patient with extrapulmonary TB who has completed treatment).

\(^c\)Defaulted: A patient whose treatment was interrupted for 2 consecutive months or more.

\(^d\)Failure: A patient with a sputum smear or culture positive at 5 months (equivalent to end of month 4 of treatment) or later during treatment. Also included in this definition are patients found to harbour a multidrug-resistant (MDR) strain at any point of time during the treatment, whether they are smear-negative or -positive.
The second component to treating HIV-positive patients with TB is starting ART if eligible or adjusting the regimen if they are already on ART. Anti-TB treatment should be started first, but ART should be started as soon as possible after starting anti-TB treatment. Starting ART quickly reduces mortality and improves TB outcomes.

<table>
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<th>DAILY DOSE</th>
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<tr>
<td>Rifampicin (R)</td>
<td>10mg/kg to a maximum of 600mg/day</td>
</tr>
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<td>Pyrazinamide (Z)</td>
<td>20-25mg/kg to a maximum of 2g/day</td>
</tr>
<tr>
<td>Ethambutol (E)</td>
<td>15-20mg/kg to a maximum of 1.6g/day</td>
</tr>
<tr>
<td>Streptomycin (S)</td>
<td>15mg/kg to a maximum of 1g/day</td>
</tr>
</tbody>
</table>
### ART Regimens Chart For Non-Pregnant, Treatment-Naive Adults*

<table>
<thead>
<tr>
<th>RECOMMENDATION</th>
<th>ART REGIMEN</th>
<th>DOSAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preferred regimens</strong></td>
<td>TDF / 3TC / NVP</td>
<td>Initial phase (first 15 days): TDF 300 mg 1x/day, 3TC 300 mg 1x/day, NVP 200 mg 1x/day. Maintenance phase (after 15 days): TDF 300 mg 1x/day, 3TC 300 mg 1x/day, NVP 200 mg 2x/day.</td>
</tr>
<tr>
<td></td>
<td>TDF / FTC / NVP</td>
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</tr>
<tr>
<td><strong>Alternative regimens</strong></td>
<td>TDF / 3TC / EFV</td>
<td>TDF 300 mg 1x/day, 3TC 300 mg 1x/day, EFV 600 mg 1x/day (in evening).</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td><strong>Alternative regimens</strong></td>
<td>ABC / 3TC / NVP</td>
<td>Initial phase (first 15 days): ABC 600 mg 1x/day, 3TC 300 mg 1x/day, NVP 200 mg 1x/day. Maintenance phase (after 15 days): ABC 600 mg 1x/day, 3TC 300 mg 1x/day, NVP 200 mg 2x/day.</td>
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<td></td>
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<td>ABC 600 mg 1x/day, 3TC 300 mg 1x/day, EFV 600 mg 1x/day (in evening).</td>
</tr>
</tbody>
</table>

*EFV is contraindicated in the 1st trimester of pregnancy. For more information on HIV and pregnancy, see Unit 5. For all women of reproductive age initiating ART, ensure access to effective contraception and discuss their plans for future pregnancy.

Treatment information may change over time. Always check the current treatment guidelines in your clinic and ask an experienced clinician for help if you are not sure.
Some antiretroviral drugs – especially nevirapine (NVP) and protease inhibitors (PI) – interact with rifampicin, lowering the level of both the HIV drugs and the rifampicin in the blood. For patients starting ART, choose a regimen that does not contain NVP. For patients taking ART containing NVP, replace NVP with EFV before starting the anti-TB treatment. If a patient is currently receiving a PI-containing regimen and requires anti-TB treatment, seek the opinion of an expert.

The third component to treating HIV-positive patients with TB is to start cotrimoxazole for pneumonia prophylaxis if the patient is not already receiving it.

Criteria for starting cotrimoxazole prophylaxis in non-pregnant adults:
- If HIV-positive, start cotrimoxazole

Dosage prescribed:
- 960mg orally once a day

In addition to these three components, treatment of HIV-positive patients with TB includes daily accompaniment and adherence support, nutrition and other necessary social support, active case-finding, and patient education.
Follow-Up of HIV-Positive Patients Receiving Anti-TB Treatment

Monitoring the Effects of Anti-TB Treatment

NEW CASE

- Sputum smear microscopy at end of initial phase (month 2)
  - Positive
    - Extend intensive phase by 1 month
      - Repeat sputum smear microscopy at end of month 3
    - Negative
      - Transition to continuation phase

  - Send culture and DST
    - Transition to continuation phase while waiting for culture and DST and decide on further treatment based on results.
    - If patient clinically deteriorating consult TB expert for possible empiric treatment of MDR-TB

PREVIOUSLY TREATED CASE

- Sputum smear microscopy at end of Month 3
  - Positive
    - Extend intensive phase by 1 month + send culture and DST
      - If patient clinically deteriorating consult TB expert for possible empiric treatment of MDR-TB
    - Negative
      - Transition to continuation phase

  - Sputum smear microscopy at end of month 4
    - Positive
      - Extend intensive phase by 1 month + send culture and DST
      - If patient clinically deteriorating consult TB expert for possible empiric treatment of MDR-TB
    - Negative
      - Transition to continuation phase


As seen in earlier units, HIV-positive patients are followed regularly in the HIV Program. When an HIV-positive patient is diagnosed with TB, TB care is integrated into their routine monthly visits in the HIV Program.
HIV patients with TB need intensive follow-up care:
- Refer for or continue routine HIV care
- Monitor effect of anti-TB treatment (in co-infected patients, this is integrated into routine HIV care)
- Manage side effects
- Daily accompaniment and adherence support, nutritional and other social support
- Education about TB and HIV

To determine if patients are responding to their anti-TB treatment:
- Monitor the patient’s symptoms to see if they resolve (cough, fever, night sweats, etc.)
- Monitor the patient’s sputum smears to see if they convert from positive to negative (showing that the anti-TB treatment is effective at killing the TB bacteria)

It usually takes several days to several weeks for a patient’s TB symptoms to resolve, depending upon factors such as the patient’s baseline nutritional status, overall health.

If the anti-TB treatment is effective at killing the TB bacteria, sputum smears usually convert from positive to negative in several weeks. Three samples should be collected each time the patient requires a sputum smear test.

While differences exist between TB treatment for patients who are new to treatment and who have been previously treated, the schedule for routine sputum smear microscopy is the same for both types of patients. Sputum sampling is done at the end of the initial phase, at the end of month 4 of treatment and at the end of the continuation phase. All decisions concerning treatment are based on these results.

For both new and retreatment cases, if smears are positive at the end of the initial phase, the initial phase is extended for 1 month. Sputum is retested at the end of this additional month – if the results are negative, the patient transitions to the continuation phase. If the results are positive, a sputum specimen is sent to the national reference laboratory for culture and drug sensitivity testing to determine if the TB bacteria is resistant to anti-TB drugs. Decisions about further treatment are based on these results.

Treatment failure means that the patient’s TB infection does not respond to the anti-TB treatment prescribed. This may mean that the bacteria are resistant to two of the standard medications, isoniazid and rifampicin. This is called multi-drug resistant TB (MDR-TB) and it is a very serious infection.
Multi-drug resistant TB is 100% fatal without treatment and, like all TB, it is deadly in patients with HIV. It is also much more difficult and expensive to diagnose and treat than drug sensitive TB (typical TB which can be treated with isoniazid and rifampicin). In other words, if MDR-TB spreads in the community and becomes a common infection, it will be much harder to cure patients with TB.

Suspect MDR-TB when a fully adherent patient fails to improve, or relapses quickly, on TB therapy.

The main cause of MDR-TB is lack of adherence to TB treatment. This is why the role of CHWs in ensuring adherence is so important for the health of the community: to prevent the spread of MDR-TB. However, another cause of MDR-TB is a direct spread of the MDR-TB bacteria from one patient to another. This spread is a very serious public health problem.

Catching cases of MDR-TB is one reason why it is important to monitor bacteriological response on this schedule. All treatment failure cases should be assumed to be MDR-TB. Consult with an experienced clinician. Culture and drug sensitivity tests are done at the national lab to confirm these cases.

MDR-TB treatment differs from regular TB treatment in three ways:

- MDR-TB requires more medications (at least 4) that have many more side effects. Almost all patients have significant side effects, though they can be managed symptomatically in most cases.
- Much longer treatment course (usually 18-24 months).
- Lower chance of treatment success, though still reasonably high chance if patient remains fully adherent to appropriate regimen.

Side Effects

In general, minor side effects of TB medications are managed without changing TB or HIV regimens. (Specific management of HIV medication side effects is covered in Unit 2). With urgent side effects, the offending medication(s) are stopped, the patient often requires hospitalization, and when they are ready to resume treatment, usually a different regimen is chosen. The presence of the major side effects described in the chart below should prompt the clinician to seek the advice of a senior clinician immediately.
## UNIT 3 – Comprehensive Approach to the Management of TB/HIV Co-Infection in Adults

### SIDE EFFECT | DRUG | MANAGEMENT
--- | --- | ---
**MINOR:**
Orange urine | Rifampicin | Reassure patient that this is normal.
Joint pain | Pyrazinamide | Aspirin or paracetamol.
Anorexia, nausea, abdominal pain | Rifampicin, Pyrazinamide, Isoniazid | Give drugs before bedtime or with small meals. If symptoms persist or worsen, consider them as major side effects (see below).
Pain or burning sensation in hands or feet (paresthesias) | Isoniazid | Pyridoxine.
Drowsiness | Isoniazid | Reassure the patient. Give drugs before bedtime.
Mild itchy skin without rash | Rifampicin, Isoniazid | Symptomatic treatment (e.g. antihistamines). Look for other causes (e.g. scabies).

### URGENT:
Skin rash with or without itching | Streptomycin, Isoniazid, Rifampicin, Pyrazinamide | Stop anti-TB drugs. Refer to district hospital.
Skin rash with fever, mucous membrane ulcers, edema, or shock (Stevens-Johnson’s Syndrome) | Streptomycin | Stop anti-TB drugs. Refer to district hospital.
Jaundice, severe anorexia, vomiting and nausea (suspect acute liver failure if confusion, vomiting, and jaundice) | Most anti-TB drugs, especially Isoniazid, Rifampicin, Pyrazinamide | Stop anti-TB drugs. Refer to district hospital.
Visual impairment (color blindness) | Ethambutol | Stop anti-TB drugs. Refer to district hospital.
Deafness or dizziness (vertigo) | Streptomycin | Stop anti-TB drugs. Refer to district hospital.
Shock, purpura, thrombocytopenia, acute renal failure | Rifampicin | Stop anti-TB drugs. Refer to district hospital.
Decreased urine output | Streptomycin | Stop streptomycin.

**NOTE:** THIS DOCUMENT IS A DRAFT PENDING INTERNAL AND EXTERNAL REVIEW. NOT FOR DISTRIBUTION OR EDITING.
Management of Patients With All Negative Sputum Smears and Chest X-Ray Findings NOT Suggestive of TB

If a patient has signs or symptoms of TB but all her/his sputum smears are negative and the chest x-ray is NOT suggestive of TB, the most likely diagnosis is bacterial pneumonia, but TB remains a possibility.

Start oral antibiotics to treat bacterial pneumonia and see if the patient improves within 3-5 days (but consider *Pneumocystis jirovecii* pneumonia (PCP) treatment if patient with advanced HIV presents with severe shortness of breath or hypoxia). If the patient improves, make sure s/he finishes the full course of oral antibiotics and is referred for or continues routine HIV care. If the patient does not improve after 3-5 days of oral antibiotics, immediately re-test for TB by doing 3 sputum smears. If one or more is positive, treat for TB. If all smears are negative again and no other diagnosis explains the symptoms, consult with an experienced clinician to decide whether the patient should be treated for smear-negative pulmonary TB or extrapulmonary TB. DO NOT delay the decision to start anti-TB treatment for longer than 5 days.

*Pneumocystis jirovecii* pneumonia (PCP), pneumonia caused by a fungus called *Pneumocystis jirovecii*, is also a possibility in patients with advanced HIV (CD4 cell count <200 cells/mm³). Usual symptoms are moderate to severe shortness of breath progressing over weeks. Signs on exam include hypoxia (lack of oxygen in the blood), particularly on exertion (e.g., check O2 saturation on exertion, if available), and often a normal lung exam.
Treatment options for community acquired pneumonia in the adult, HIV-positive, ambulatory patient include:

Option 1: Amoxicillin (1g by mouth three times per day for seven days) or Amoxicillin-clavulanic acid (500/125mg by mouth two times per day for seven days) WITH OR WITHOUT a macrolide antibiotic (such as azithromycin, clarithromycin, erythromycin).

Option 2: Doxycycline (100mg by mouth two times per day for seven days)

Note: DO NOT use quinolones, as they are active against TB and may confuse the clinical picture, as well as leading to resistance.

The recommended treatment for PCP pneumonia caused by the fungus *Pneumocystis jirovecii* is:

Cotrimoxazole 5mg/kg (of trimethoprim) three times per day for 21 days. If the patient has O2 sat <90 at rest or on exertion or is severely dyspneic at rest or with ambulation, also give prednisilone 40mg two times per day for five days, then 40mg daily for five days, then 20mg daily until completion of therapy.

**KEY POINTS**

1. An ambulatory HIV-positive patient suspected of TB with all negative sputum smears and a chest x-ray NOT suggestive of TB should be treated for bacterial pneumonia with oral antibiotics.

2. If the patient improves after 3-5 days of oral antibiotics, s/he should complete the full course of antibiotics and be referred for or continue routine HIV care.

3. If the patient does not improve with oral antibiotics, re-test for TB. If all sputum smears are still negative, seek the help of an experienced clinician who can help make a diagnosis of smear-negative pulmonary or extrapulmonary TB. DO NOT delay the decision to start anti-TB treatment for longer than 5 days.

**Smear-Negative Pulmonary TB and Extrapulmonary TB**

Smear-negative pulmonary TB is TB in the lungs that, for a variety of reasons, does not produce large quantities of TB bacteria in the sputa and so is not detected in sputum smears.

Extrapulmonary TB is an infection with TB bacteria that is located outside of the lungs, in other body organs. The sputum smears are negative since the TB bacteria are not in the lungs. It is a very serious form of TB that is more difficult to diagnose. It is more common in patients with advanced HIV disease.

Smear-negative pulmonary TB and extrapulmonary TB are complex diseases that should always be managed by an experienced physician. Clinicians who care for HIV-positive patients must know when to suspect extrapulmonary TB and when to ask for help or refer the patient.
As an example, Jean is a 24-year-old man living with HIV who complains of fever, night sweats, and weight loss. He is not coughing, but he feels very sick. He came to clinic 4 days ago and was tested for TB. All 3 sputum smears were negative and a chest x-ray was not suggestive of TB. He started antibiotics 4 days ago, but has not improved.

The first step is to reassess for TB by repeating 3 sputum smears. If all 3 sputum smears are negative again and no other diagnosis explains the symptoms, consult with an experienced clinician to decide if the patient should be treated for smear-negative pulmonary TB or extrapulmonary TB.

Suspect smear-negative / extrapulmonary TB in an HIV-positive patient when: symptoms such as fever, night sweats, or weight loss are present, but all sputum smears are negative and the chest x-ray is not suggestive of TB; the patient has not responded to oral antibiotics; a second series of sputum smears are also negative; and no other diagnosis is obvious.

Extrapulmonary TB can affect nearly every organ and tissue of the body. Lymph nodes, pleura (thin membrane that surrounds the lungs) and bones and joints are the most common sites of extrapulmonary TB, while TB of the heart (in the pericardium which envelops the heart), meninges and a disseminated (miliary) form are more likely to result in a fatal outcome.

**Extrapulmonary TB**

- **Meninges**
- **Lymph Nodes**
- **Pleura**
- **Pericardium**
- **Bone**
- **Joints**
- **Genitourinary System**
- **Gastrointestinal Tract**
- **Blood**
In addition to systemic symptoms (e.g., fever, weight loss), patients with extrapulmonary TB often present local signs and symptoms. Information gathered during the physical exam can help you to diagnose extrapulmonary TB. For example, seeing a large lymph node on the neck, or a lump on the spine where the vertebrae have collapsed may be due to localized TB infection.

If you suspect a case of extrapulmonary TB, consult an experienced physician. Good treatment outcome depends on an early diagnosis. Treatment of most forms of extrapulmonary TB is the same as for pulmonary TB.

As seen in the previous activity, the decision to start anti-TB treatment for patients with suspected smear-negative pulmonary and extrapulmonary TB should not be delayed for longer than 5 days.

**KEY POINTS**

1. There are two forms of TB that will not produce positive sputum smears:
   - Smear-negative pulmonary TB – TB in the lungs without TB bacteria identified in the sputum.
   - Extrapulmonary TB – TB outside lungs, in other organs and tissues.

2. Smear-negative pulmonary TB and extrapulmonary TB should always be managed by an experienced clinician. But as clinicians who care for HIV-positive patients, you must know when to suspect them and ask for help.

3. The decision to start anti-TB treatment for patients with suspected smear-negative pulmonary and extrapulmonary TB should not be delayed for longer than 5 days.
Case Studies

Task: Read each case and discuss the question in your small group. Record your answers under the each case. Refer to the clinical algorithms if necessary. After you are done, wait for instructions.

CASE STUDY #1

Part 1
Olive is a 33-year-old HIV-positive woman you have been following in the HIV clinic for 1 year. Her previous CD4 cell counts have been above 350 cells/mm³, so ART has not been started yet. However, she is taking cotrimoxazole prophylaxis and is in good compliance. Today, during a routine visit, she complains of having had a cough for the past 4 weeks. She denies having any other symptoms. She has never had TB in the past. On physical exam, her temperature is 37°C, her heart rate is 90 beats/minute, and her respiratory rate is 20 breaths/minute. She can walk without help.

Questions:
• What algorithm would you use to help you care for Olive?
• What are the steps that you would take to care for Olive?
• If you cannot do a chest x-ray at your clinic, should you transfer Olive for this test? Why?

Part 2
Two of Olive’s sputum smears are positive. Her CD4 cell count is 300 cells/mm³. Her chest x-ray is pending.

Questions:
• What should you do for Olive now?
• Should she start ART? If yes, which regimen?
• What follow-up should be done for Olive?
Part 3
Olive had 3 negative sputum smears at the end of the intensive phase of treatment and was transitioned to the continuation phase.

Question:
• What should you do next?

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

CASE STUDY #2

Part 1
Michel is a 40-year-old man who comes to clinic complaining of a cough for 3 weeks and 10 kg weight loss over the past 2 months. He has not had chronic fevers but he has been having night sweats. He does complain of shortness of breath. He comes in today because the cough has gotten worse over the past few days. He has never been tested for HIV and he has never had TB before. On physical exam, his temperature is 37°C, his heart rate is 90 beats/minute, and his respiratory rate is 25 breaths/minute. He can walk without any assistance.

Questions:
• What algorithm would you use?
• What steps should you take to care for Michel?
• What if Michel had a temperature >39°C and a respiratory rate of 35 breaths/minute?

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
UNIT 3 – Comprehensive Approach to the Management of TB/HIV Co-Infection in Adults

Part 2
The results of the initial tests are the following: HIV test positive, CD4 cell count pending, all 3 sputum smears negative. You have arranged a transfer for a chest x-ray but this cannot be done until next week.

Question:
• What diagnosis and treatment are appropriate? Why?

Part 3
Five days later, Michel’s symptoms have not improved. His CD4 is 320 cell/mm³.

Question:
• What should you do now?

Part 4
Again, all sputum smears are negative, but Michel has had a chest x-ray and an experienced clinician says the findings are suggestive of TB.

Question:
• What should you do now?
Case Study #3

Part 1
Louise is a 22-year-old woman who comes to the clinic because she has been losing weight and can no longer walk to work two miles from her home without pausing several times to catch her breath. She says the shortness of breath has been getting worse for the past 3-4 weeks, and she has had chronic fevers and night sweats. She has not had a cough, but her husband has had a cough for two months. She has never been tested for HIV and has never had TB before. On physical exam, her temperature is 38°C, her heart rate is 100 beats/minute, her respiratory rate is 25 breaths/minute. She seems very thin and her lungs are clear.

Questions:
• What algorithm would you use for Louise?
• What should you do next?

Part 2
The results of the initial tests are the following: HIV test positive, CD4 cell count 180 cells/mm³, all 3 sputum smears negative, chest x-ray findings NOT suggestive of TB.

Question:
• What diagnosis and treatment are appropriate? Why?
UNIT 3 – Comprehensive Approach to the Management of TB/HIV Co-Infection in Adults

**Patient Education**

Patient education is an important part of the comprehensive management of TB/HIV co-infection and serves to reinforce the other essential components of the comprehensive care: for example, adhering to treatment, bringing family members and other contacts to the clinic for TB and HIV testing, and staying healthy with proper nutritional supports.

CHWs and social workers play an important role in patient education. But it is vital that clinicians also educate TB patients consistently.

**Cover these points with patients:**

- **Adherence:** Take all medications as prescribed. With full adherence, you can return to a healthy, productive life.
- **Monitor symptoms:** Tell your CHW about any new symptoms you are having because they could be caused by your TB/HIV medications. If you become very ill, go to the health center immediately.
- **Case-finding:** Bring your family members and other close contacts to the clinic for TB and HIV testing.
- **Family planning:** Use family planning methods plus condoms to prevent pregnancy while infected with TB. (Pregnancy itself is not a contraindication to TB treatment. However, TB is a very serious consumptive disease that threatens the health of the mother, and preventing pregnancy will protect her health. TB medications can decrease the efficacy of hormonal contraception, so she needs to also use condoms as a back-up method every time.)

Write additional topics that you should convey to patients here:

_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________

**KEY POINTS**

1. Using the algorithm for the management of suspected TB in ambulatory HIV-positive patients helps clinicians make decisions about how to prioritize care for patients.

2. In complicated cases, clinicians should always consult an experienced clinician before making any treatment decisions.
The Role of Repetition

Patients must hear these messages over and over. Patients who are newly diagnosed with TB or TB and HIV have to absorb a lot of information. At the same time, they must get used to having a disease that requires taking medication for a long time. They often need to hear the same messages many times to fully absorb them.

Check to make sure that patients have understood what you have told them. Ask patients to repeat the information back to you in their own words. This method is sometimes called the “talk-back” method. The talk-back method assures that the patient has heard and understood the information even though this does not guarantee that the patient will remember it. You may feel awkward using the talk-back method at first, but it is very simple, and if you practice it you will become more comfortable using it.

Your coworkers – the patient’s social worker and community health worker – also educate the patient. Make sure that you, the social worker and the community health workers are all delivering the same messages. Every time you have a new TB patient, check with the community health worker and social worker to make sure that you are all telling the patient the same thing. If you contradict one another, the patient will be confused.

The patient’s family members and anyone who provides care to the patient need to be educated, too. When educating patients and their families, use words that they can all understand. For example, instead of “tachypnea”, say “fast breathing.”

Practicing Patient Education

Patient education must contain all the essential information but must also be conveyed in a manner that makes the patient feel comfortable and helps her/him to remember the key points.

Tips for effective patient education:

- Use direct eye contact
- Show a nonjudgmental attitude
- Use simple language that the patient will understand
- Conduct the visit in a private space and ensure confidentiality
- Ask the patient to bring a family member with her/him if possible so more than one person is learning the information
- Ask the patient to explain back to you what you have just said (this is sometimes called the “talk-back” method) to make sure s/he understood
- Repeat the messages during every visit
**ROLE PLAY**

**Tasks:** Choose one person to be Olive, one to be the clinician, and one to be the observer. Perform the role play (no more than 5 minutes). The clinician should use the key education messages and the communication techniques, including the talk-back method. The observer gives feedback at the end of the role play: give strengths first, then suggestions for improvement. Switch roles and repeat the steps, until all three members of your group have played the clinician.

**Patient Education Role Play Scenario**
A clinician has just told Olive, a 33-year-old HIV-positive patient, that she has TB, and has told her what medications she will be taking. Olive is a poor widow who lives in a tiny house with her children. The clinician must now educate Olive using key education messages and the talk-back method. The observer should observe how the clinician does this and be prepared to give feedback after the role play.

**KEY POINTS**

1. Clinicians must provide patient education at every follow-up visit. This includes teaching patients, their families, and their care givers about daily adherence, completing the full course of therapy, bringing family members and close contacts into the clinic for TB and HIV testing, coming to the clinic immediately if they become ill, family planning and obtaining nutritional and other supports.

2. All members of the clinical team must make sure they are giving patients, families, and caregivers consistent information about their infection and its treatment.

3. Use simple language when educating patients to increase their understanding.

4. Check with patients to make sure they understand by asking patients to repeat what you have said in their own words using the talk-back method.

5. Use good communication techniques to make patients feel more comfortable and able to ask questions and absorb the information.

6. Even when education is done well, people typically remember only part of what they hear. Therefore, you must repeat key education messages at every visit.
PART 4

Management of Suspected TB in Seriously Ill HIV-Positive Patients
Algorithm for the Management of Suspected TB in Seriously Ill HIV-Positive Patients

At every visit with each HIV-positive patient*

1. Screen for TB: cough > 2 weeks, fever, night sweats, weight loss, close contact with a TB patient
2. Check for danger signs: Temp > 39°C, HR > 120 beats/min, RR > 30 breaths/min, needs help walking
3. Detailed clinical exam for findings such as lymphadenopathy and hepatosplenomegaly

*If HIV status unknown – perform HIV test

TB suspected + danger signs

1. Start intravenous antibiotics (avoid fluoroquinolones)
2. Transfer to district hospital (if possible)

One or more positive sputum smears and/or clinical exam and/or chest x-ray findings suggestive of TB

Integrated Treatment of TB/HIV Co-Infection

1. Start anti-TB treatment
2. Start or adjust ART if eligible
3. Start or continue cotrimoxazole
4. Provide daily accompaniment and adherence support (directly observed treatment)
5. Provide nutritional support and other social support
6. Active case-finding
7. Patient education

Follow-Up Care

1. Refer for or continue routine HIV care
2. Monitor effect of anti-TB treatment (in co-infected patients, this is integrated into routine HIV care)
3. Manage side effects
4. Continue adherence support, nutritional and other social support
5. Patient education

Send culture and DST
Consult TB expert
Consider treating other OIs (e.g. PCP)

Clinical Improvement

No clinical improvement

Complete course of antibiotics

Refer for or continue routine HIV care

When your HIV positive patient is seriously ill and you suspect TB, you should use the Algorithm for Suspected TB in Seriously Ill HIV-positive patients.

This algorithm tells you to identify danger signs and then start antibiotics immediately. This is because danger signs may indicate that a serious bacterial pulmonary infection is present. Bacterial pulmonary infections are frequent in HIV-positive patients and must be treated right away to prevent death or severe morbidity.

**T**reatment options for community-acquired pneumonia in the adult, HIV-positive, severely-ill patient include:

- Ceftriaxone (1g intravenously two times per day for ten days)
- OR Ampicillin + Gentamicin (Ampicillin 2g intravenously four times per day; Gentamicin 240mg if <60kg (or 320mg if >60kg) intravenously one time per day for ten days) OR Amoxicillin-clavulanic acid (500/125mg intravenously two times per day for ten days)
- AND Doxycycline (100mg by mouth two times per day for ten days)

**Note:** Do not use quinolones, as they are active against TB and may confuse the clinical picture, as well as leading to resistance.

At this point, these patients should be referred to a district level hospital for more specialized care if possible. If referral is not possible, the patient should be kept under observation at the health center and should be treated following this algorithm.

The same tests should be ordered for severely ill patients as for ambulatory patients except that a full blood count is added. A full blood count will provide information about the degree of infection and the body’s response to infection, and anemia.

Patients who have one or more positive sputum smear test and/or a chest x-ray suggestive of TB should be isolated. This will prevent the spread of TB to other hospitalized patients and staff. Also, staff or visitors coming in contact with the patient should wear N95 masks for as long as the patient is sputum smear positive.

If the patient improves, continue anti-TB treatment and provide follow-up of care as seen previously in the algorithm for ambulatory patients.

If the patient does not improve with anti-TB treatment, a possible explanation for the lack of improvement is that TB is resistant to the anti-TB treatment prescribed. Culture and Drug Sensitivity Testing (DST) should be sent to the national reference laboratory and a TB expert consulted. Also, HIV-positive patients are more likely to have several infections at the same time. Consequently, clinicians should consider treating for other opportunistic infections (PCP, for example, if treatment has not already been started).
Determining whether or not a patient is improving on treatment is somewhat subjective, and is based on the patient’s reported symptoms such as feeling better and having fewer fevers and night sweats. Cough and chest x-ray findings may take weeks to improve despite clear clinical improvement, and should not be used to determine if treatment is working.

If all sputum smears are negative and the chest x-ray is not suggestive of TB, treatment for PCP should be considered if the patient presents with moderate to severe shortness of breath, hypoxia, particularly with exertion (O2 saturation <90 on exertion) and a CD4 cell count <200 cells/mm³.

If the patient does not improve with intravenous antibiotics +/- PCP treatment after 3-5 days, start anti-TB treatment. If the patient is improving with antibiotics +/- PCP treatment, reassess for TB one more time with sputum smear microscopy to make sure you are not missing a diagnosis of TB, which could be deadly for the patient.

If one or more sputum smears are positive or you still have a very high clinical suspicion for TB, start anti-TB treatment. If sputum smears are negative and your clinical suspicion for TB is low, complete the full course of treatment for bacterial pneumonia +/- PCP. Refer the patient for routine HIV care.

Here are two cases you reviewed earlier:

**CASE STUDIES**

Olive is a 33-year-old HIV-positive woman whom you have been following in the HIV clinic for 1 year. Her previous CD4 counts have been >350, so she has not been started on ART. Today, during a routine visit, she complains of having had a cough for the past 4 weeks. She denies having any other symptoms. On physical exam, her temperature is 37°C, her heart rate is 80/minute, and her respiratory rate is 20/minute. She can walk without any help.

Faustin is a 39-year-old HIV-positive man whom you have been following in the HIV clinic for the past 4 months. He takes AZT, 3TC, NVP, and cotrimoxazole prophylaxis. Today, during a routine visit, he complains of coughing for the past 4 weeks and of coughing up blood for the past eight days. He also complains of shortness of breath and generalized weakness. He has had fevers but denies any night sweats. On physical exam, his temperature is 39°C, his pulse is 120/minute, his respiratory rate is 32/minute, and his oxygen saturation is 92% on room air.

The presence of danger signs in Faustin indicates that you should use the algorithm for seriously ill patients to help you determine the best care for him. The absence of danger signs in Olive indicates that you should use the algorithm for ambulatory patients.
**Unit 3**

**Comprehensive Approach to the Management of TB/HIV Co-Infection in Adults**

**Task:** While comparing at the algorithms for seriously ill versus ambulatory patients, what are the similarities and differences in the approach to care? Make a list for similarities and a list for differences.

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**Key Points**

1. HIV-positive patients suspected of TB and presenting with danger signs should be started on intravenous antibiotics immediately (even before TB testing) and transferred to the district hospital.

2. For patients with all negative smears and chest x-ray findings not suggestive of TB, clinicians should maintain a high level of suspicion for TB even if the patient improves on intravenous antibiotics +/- PCP treatment.
CASE STUDY #1

Part 1
Faustin is a 39-year-old HIV-positive man you have been following in the HIV clinic for the past 4 months. He takes AZT+3TC+NVP, and cotrimoxazole prophylaxis. Today, during a routine visit, he complains of having had a cough for the past 4 weeks and coughing up blood for the past 8 days. He also complains of shortness of breath and generalized weakness. He thinks he has had fevers but denies any night sweats or weight loss. He has never had TB in the past. On physical exam, his temperature is 39°C, his heart rate is 120 beats/minute, his respiratory rate is 32 breaths/minute.

Questions:
• What are your first management priorities for Faustin?
• What should be done next?

Part 2
The results of Faustin’s tests are:
• Sputum smear microscopy: 2 out of 3 smears positive
• CD4 cell count: 320 cells/mm³
• Chest x-ray: findings suggestive of TB

Questions:
• What should you do next?
• What follow up should be done?
### CASE STUDY #2

#### Part 1
Médiatrice is a 26-year-old woman with an unknown HIV status who complains of fever and cough for 3 weeks and has also lost about 10kg over the past month. On physical exam, her temperature is 39°C, her heart rate is 90 beats/minute, and her respiratory rate is 32 breaths/minute.

Questions:
- What are your first management priorities for Médiatrice?
- What should be done next?

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#### Part 2
The results of Médiatrice’s tests are:

- HIV test: positive
- Sputum smear microscopy: 3 out of 3 smears positive
- CD4 cell count: 280 cells/mm³
- Chest x-ray: findings suggestive of TB

Question:
- What should you do now?

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#### Part 3
Unfortunately, Médiatrice fails to significantly improve after 5 days of anti-TB treatment and antibiotics. She still has high fevers and night sweats.

Questions:
- What should you be worried about now?
- What should you do next?
CASE STUDY #3

Part 1
Gédéon is a 38-year-old HIV-positive man who presents for his initial visit at the HIV clinic complaining of 3 weeks of progressive and now severe shortness of breath and dry cough. On exam, his temperature is 38°C, his heart rate is 100 beats/minute, his respiratory rate is 35 breaths/minute, and his oxygen saturation is 89% on room air. On ambulation, his oxygen saturation falls to 75%.

Questions:
• What are your first management priorities for Gédéon?
• What should be done next?
_____________________________________________________________________________
_____________________________________________________________________________
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Part 2
The results of Gédéon’s tests are:
• Sputum smear microscopy: all smears negative
• CD4 cell count: 180 cells/mm$^3$
• Chest x-ray: findings NOT suggestive of TB

Questions:
• Gédéon’s 3 sputum smears are negative – what would be a likely diagnosis?
• What should be done for Gédéon?
• If Gédéon improves on antibiotics and PCP treatment, what should be done next?
_____________________________________________________________________________
_____________________________________________________________________________
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Conclusion

**Task:** Reflect silently on how you can use what you have learned in this unit to improve your work when you return to your clinic. When you have reflected for a minute or two, write down three things you will CHANGE in your practice to use what you have learned. These will be your three resolutions.

**Resolutions:**

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Glossary

**Active case-finding**: Actively searching for, identifying, and testing all persons in the community with TB symptoms.

**Adherence**: Consistently following a prescribed treatment regimen, which can include medications and other treatments.

**Ambulatory**: A patient who is not severely-ill or bed-ridden, and who is well enough to walk to his appointment.

**Cotrimoxazole prophylaxis**: Administration of the broad-spectrum antimicrobial drug cotrimoxazole (also known as Sulfamethoxazole-Trimethoprim (SMX-TMP)) to protect an HIV+ person from a range of dangerous opportunistic infections, including bacterial infections, malaria, PCP, and toxoplasmosis.

**Cough etiquette**: Covering the nose and mouth when coughing or sneezing, one way to decrease TB transmission.

**Danger signs**: Clinical signs or symptoms which signal that a patient is seriously ill, including elevated heart rate, respiratory rate and temperature, and/or decreased blood pressure.

**Directly observed therapy (DOT)**: A method of medication administration used by community health workers in which they watch the patient take each pill in order to ensure correct and consistent treatment for TB patients.

**Extrapulmonary TB**: TB infection of tissues or organs outside of the lung, generally sputum smear-negative since it is not in the lungs and isn't transmitted through coughing, generally non-infectious, but often more severe since it tends to occur in patients whose immune systems are compromised.

**Infection control**: Preventing the spread of infection by actively protecting the patients, yourself, and the environment from the TB bacterium.

**Multi-drug resistant TB**: TB which is not sensitive to first line medications isoniazid and rifampicin, and requires more potent treatment regimens.

**N95 mask**: A well-fitted, sturdy mask which provides appropriate protection from TB infection by filtering the air as the wearer of the mask inhales. The N95 mask should be worn at all times when treating patients with confirmed or suspected TB.
**Patient Isolation:** Separating an infected patient from other patients to prevent the spread of infection, one method of infection control.

**Sputum smear microscopy:** A test of sputum that determines whether the person has an active TB infection by looking for the TB bacterium with a microscope.

**TB/HIV co-infection:** An infection with both the HIV virus and the TB bacterium at the same time, a serious combination which can be fatal.

**Talk-back method:** A patient education technique in which the patient is asked to repeat in their own words what has just been explained to them to check their comprehension.

**Treatment failure:** When treatment is ineffective against an infection.
UNIT 3 – Comprehensive Approach to the Management of TB/HIV Co-Infection in Adults

**Abbreviations**

ART: Antiretroviral therapy  
DOT: Directly observed therapy  
DST: Drug sensitivity testing  
PCP: *Pneumocystis jirovecii* pneumonia  
POSER: Program on Social and Economic Rights  
SMX-TMP: Sulfamethoxazole-Trimethoprim, also known as Cotrimoxazole  
TB: Tuberculosis

**Key References**


   [www.who.int/entity/tb/strategy/en/](http://www.who.int/entity/tb/strategy/en/)
UNIT 3 – Comprehensive Approach to the Management of TB/HIV Co-Infection in Adults

Pre-Test

1. All of the following statements are true EXCEPT:
   A. People living with HIV are more likely to get TB than people who are HIV negative
   B. TB infection worsens HIV disease
   C. The prevalence of TB has been increasing in Rwanda for 20 years
   D. TB/HIV co-infection is rare

2. Which of the following are ways in which community health workers provide care for TB/HIV patients?
   A. Directly observed therapy
   B. Monitoring patients for drug side effects
   C. Providing community education
   D. A & B
   E. All of the above

3. Active case-finding means:
   A. To identify if the patient has had TB in the past and whether their treatment ended in relapse, default, or failure
   B. To identify and test for TB all persons living in the same household and/or coming into close contact with a TB patient
   C. Taking a complete family history to determine if the patients’ relatives have had TB in the past and the outcomes of their treatments
   D. Tracing how a patient may have contracted TB

4. When you collect a patient’s sputum sample, safety precaution(s) you should take include:
   A. Be in a waiting room
   B. Be indoors and far from an open window
   C. Wear a surgical mask and gloves
   D. Wear an N-95 mask and gloves

5. Which of the following are strategies for good patient communication?
   A. Using simple language the patient can understand
   B. Giving patient education only during the first consultation
   C. Asking the patient to repeat what they have learned to check their understanding
   D. A & C
   E. A & B
6. Which of the following is part of the treatment plan for an HIV-positive patient who has a positive sputum smear?
   A. TB treatment
   B. Starting or adjusting ART, if eligible
   C. Co-trimoxazole prophylaxis
   D. Social services like accompaniment, nutritional support, and others
   E. All of the above

7. Which of the following statements is true?
   A. There are no drug interactions between HIV and TB treatment drugs
   B. HIV and TB treatment regimens can never be administered together because of major drug interactions
   C. Patients taking rifampicin should not take nevirapine
   D. As a clinician treating TB, you do not have to be concerned with drug interactions

8. Which of the following type of TB is resistant to isoniazid and rifampin?
   A. Pulmonary TB
   B. Extrapulmonary TB
   C. Multi-drug resistant TB
   D. Extensively drug-resistant TB

9. What should you do for ambulatory HIV-positive patients who have concerning signs and symptoms of respiratory infection but who are sputum smear negative after being tested for TB for the first time?
   A. Treat for pneumonia and follow-up in one month
   B. Treat for pneumonia. If there is no improvement in 3-5 days, retest for TB
   C. Treat for TB
   D. Treat for TB and pneumonia

10. Write True or False after each statement regarding TB infection control measures
    A. Active TB patients can be safely placed with other patients in a large hospital room or indoor waiting area _____________
    B. N95 masks and surgical masks are equally effective in reducing exposure to TB _____________
    C. Teaching patients to cover coughs and sneezes is an important piece of patient education that can help to reduce transmission of TB to others _____________
    D. Active case-finding is an important way to stop the spread of TB _____________
    E. Healthcare providers can also play a role in prevention by periodically getting tested so that they know their own status _____________
11. Danger signs which identify a seriously ill patient include: (Fill in the blank)
   A. Temperature ≥ _____________
   B. Heart rate ≥ _____________
   C. Respiratory rate ≥ _____________
   D. Patient cannot _____________ on his own

12. TB screening for every HIV+ patient at every visit includes review of the following signs and symptoms? (Fill in the blank)
   A. _____________
   B. _____________
   C. _____________
   D. _____________

13. The following patient education messages should be given to every patient taking HIV and TB medication. (True or False)
   A. Never eat rice with medication _____________
   B. Complete the full treatment as prescribed _____________
   C. Go to the clinic immediately if you have side effects or become ill _____________
   D. Bring family members and close contacts into the clinic for testing _____________
   E. Family planning to prevent pregnancy during treatment is important _____________
   F. Go to the clinic immediately if your urine is an orange color _____________

14. Which three laboratory and imaging tests should you do for every HIV+ person with suspected TB? (Fill in the blank)
   A. _____________
   B. _____________
   C. _____________

15. You should suspect MDR-TB when you see the following signs and/or symptoms in a patient on TB medication:
   A. No improvement in cough after 7 days on treatment
   B. Positive sputum smear after a full course of treatment taken properly
   C. The patient’s CD4 count is below 350
   D. All of the above
UNIT 3 – Comprehensive Approach to the Management of TB/HIV Co-Infection in Adults

Post-Test

1. All of the following statements are true EXCEPT:
   A. People living with HIV are more likely to get TB than people who are HIV negative
   B. TB infection worsens HIV disease
   C. The prevalence of TB has been increasing in Rwanda for 20 years
   D. TB/HIV co-infection is rare

2. Which of the following are ways in which community health workers provide care for TB/HIV patients?
   A. Directly observed therapy
   B. Monitoring patients for drug side effects
   C. Providing community education
   D. A & B
   E. All of the above

3. Active case-finding means:
   A. To identify if the patient has had TB in the past and whether their treatment ended in relapse, default, or failure
   B. To identify and test for TB all persons living in the same household and/or coming into close contact with a TB patient
   C. Taking a complete family history to determine if the patients' relatives have had TB in the past and the outcomes of their treatments
   D. Tracing how a patient may have contracted TB

4. When you collect a patient’s sputum sample, safety precaution(s) you should take include:
   A. Be in a waiting room
   B. Be indoors and far from an open window
   C. Wear a surgical mask and gloves
   D. Wear an N-95 mask and gloves

5. Which of the following are strategies for good patient communication?
   A. Using simple language the patient can understand
   B. Giving patient education only during the first consultation
   C. Asking the patient to repeat what they have learned to check their understanding
   D. A & C
   E. A & B
6. Which of the following is part of the treatment plan for an HIV-positive patient who has a positive sputum smear?
   A. TB treatment
   B. Starting or adjusting ART, if eligible
   C. Co-trimoxazole prophylaxis
   D. Social services like accompaniment, nutritional support, and others
   E. All of the above

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   D. Treat for TB and pneumonia

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    C. Teaching patients to cover coughs and sneezes is an important piece of patient education that can help to reduce transmission of TB to others _____________
    D. Active case-finding is an important way to stop the spread of TB _____________
    E. Healthcare providers can also play a role in prevention by periodically getting tested so that they know their own status _____________
UNIT 3 – Comprehensive Approach to the Management of TB/HIV Co-Infection in Adults

11. Danger signs which identify a seriously ill patient include: (Fill in the blank)
   A. Temperature ≥ ____________
   B. Heart rate ≥ ____________
   C. Respiratory rate ≥ ____________
   D. Patient cannot ____________ on his own

12. TB screening for every HIV+ patient at every visit includes review of the following signs and symptoms? (Fill in the blank)
   A. ____________
   B. ____________
   C. ____________
   D. ____________

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   C. ____________

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   C. The patient’s CD4 count is below 350
   D. All of the above