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ACRONYMS

AFB  Acid Fast Bacilli
ART  Anti Retroviral Treatment
ARV  Anti Retro Virals
CPT  Cotrimoxazole Preventive Treatment
CTC  Care and Treatment Clinic
CXR  Chest X-Ray
DR-TB  Drug-Resistant Tuberculosis
DST  Drug Susceptibility Testing
EPTB  Extra-Pulmonary Tuberculosis
HC  Health Centre
HCW  Health Care Worker
HF  Health Facility
HFS  Health Facility Staff
ICAP  International centers for AIDS and Treatment Programs
ICF  Intensified TB case Finding
IPT  Isoniazid Preventive Treatment
MDR-TB  Multi-Drug Resistant Tuberculosis
MOHSW  Ministry of Health and Social Welfare
NACP  National AIDS Control Program
NTLP  National Tuberculosis and Leprosy Program
PLHIV  People living with HIV/AIDS
PTB  Pulmonary Tuberculosis
TB  Tuberculosis
TB IC  Tuberculosis Infection Control
VCT  Voluntary Counseling and Testing
AKNOWLEDGEMENTS
This manual was developed by the International Centers for AIDS and Treatment Programs (ICAP) - Columbia University of Tanzania with technical assistance from PharmAccess. The draft manual is under field testing and it is currently under review by MOHSW Tanzania. The content of the manual is in line with the national TB/HIV policy and guidelines and it is based on the national TB/HIV training module developed by the Ministry of Health and Social Welfare (MOHSW) of Tanzania, 2008.

1. INTRODUCTION
This manual is expected to be used by Health Care Workers (HCWs) at HIV Care and Treatment centers and at TB clinics for the management of TB/HIV co-infected patients. The topics of this manual are described during the short TB/HIV refresher meeting on standard operating procedures developed by the International Centers for AIDS and Treatment Programs (ICAP) - Columbia University and based on the national TB/HIV training module developed by the Ministry of Health and Social Welfare (MOHSW) of Tanzania, 2008.
2. TB/HIV BASICS

Tuberculosis is the leading cause of death amongst people with an HIV infection, and HIV, through the reduction of immunity, fuels the TB epidemic where there is overlap between those infected with HIV and those infected with *Mycobacterium tuberculosis*.

The risk of developing TB disease in those who are co-infected with HIV, increases to 5–15% annually, rising as immune deficiency worsens, with a lifetime risk estimated to be as high as 50%.

TB is often the first opportunistic infection in HIV-infected persons. The clinical presentation of TB may be altered in HIV-positive patients, especially in advanced stages of HIV-infection when immunity is considerably compromised.

Thus, HIV prevention and care is a priority concern for TB Programmes and TB care and prevention is a priority concern for national HIV/AIDS control programmes. The main objectives of TB/HIV collaboration are:

- Reduce HIV incidence among TB patients
- Reduce TB incidence among people living with HIV/AIDS (PLHIV)
- Improve the care of people who are infected with both TB and HIV
2.1 The impact of the association between HIV and TB

The following associations between HIV and TB explain the path that links together the immunological aspects and the epidemiological outcome of the co-infection:

- HIV enhance progression from TB infection to disease
- TB infection and disease are more difficult to diagnose among PLHIV
- TB disease is more difficult to treat among PLHIV
- Illness and mortality are increased
- Risk of recurrence of TB after completing treatment is increased
- HIV can increase the spread drug resistance

2.2 Mechanisms for collaboration and consultation: delivery models

At the CTC, any PLHIV should be screened for TB at every visit, referred to the laboratory for diagnosis if TB is suspected and then, if TB is diagnosed, to the TB clinic for treatment.
At TB clinic, TB patients should be tested for HIV, treated first for TB and then assessed for ART by the CTC officer, unless the TB officer received an ART course by NACP.

Operationalising TB HIV activities

**TB Clinic**

- HIV testing
- TB Rx/CPT/ART
- Psychosocial support

**HIV testing**

- **HIV negative**
- **HIV positive**

- CPT provided at TB clinic or CTC
- ART provided at TB clinic or CTC

**Operationalising TB HIV activities**

**CTC**

- ART
- CPT
- Psychosocial Support
- TB screening

- TB diagnosis & referral to TB clinic for Rx
- Repeat TB screening at every visit

**Yes**

**No**
3. INTENSIFIED TB CASE FINDING: TB SCREENING AMONG PLHIV

The following set of questions should be administered to every PLHIV.
1. **Cough for two or more weeks?**
2. **Coughing up bloodstained sputum (haemoptysis)?**
3. **Fever for two or more weeks?**
4. **Noticeable weight loss for new patients or a 3 kg weight loss in a month (subsequent visit)?**
5. **Excessive sweating at night for two or more weeks?**

The following TB screening questionnaire should be available at CTC and, it should be administered at every visit and it applies only to adult PLHIV only.
Generic questions to the patient or waiting for the patient reporting any sign/symptom is not considered an efficacious strategy also because patients sometimes have different perceptions of their health or they are afraid to be stigmatized therefore they do not report their actual symptoms.
If the PLHIV does not report any sign or symptom listed in the TB questionnaire, he/she has to be re-assessed at the next follow up visit using the TB screening questionnaire.

► **However, if the patient has any other sign/symptom that might be strongly suspect for active TB (e.g. Extra-pulmonary) it is always advisable to refer for clinical opinion.**
4. TB/HIV REFERRAL SYSTEM

The referral system for TB screening may vary according to the setting.

- The CTC staff should refer to the laboratory those PLHIV who are TB suspects along with the Sputum request form.
- The PLHIV has to be sensitized to come back to the CTC after having given the sputum samples to the laboratory.
- The laboratory will send the sputum result to CTC.

At any referral, it is extremely important to sensitize the PLHIV about the importance to complete the screening cycle and come back to the CTC for the final evaluation. Also the laboratory technicians should be sensitized to reinforce this message to the PLHIV accessing the service.

**PLHIV suspected of TB should not be referred to the TB clinic for TB diagnosis, to avoid the risk to come in close contact with confirmed TB cases.**
4.1 Referral forms

This generic referral form below should be used by CTC staff to transfer/refer the PLHIV to any unit or to TB clinic.

---

**Generic referral form from CTC to TB clinic or any other unit**

THE UNITED REPUBLIC OF TANZANIA MINISTRY OF HEALTH

GENERAL CLIENT REFERRAL FORM

From: …… … … …… … … … … … … … … … … …… Tel. Number: …… … … … ….
Address: …… … … … … … … … … … … … … … … … … … … … … … … … … … … ….

To: …… …… … … … … … … … … … … … … … … Tel. Number: …… … … … …….
Address: …… … … … … … … … … … … … … … … … … … … … … … … … … … … ….

Client Name: …… …… … … … … … … … … … … … … … … … … … … … … … … … … ….. Tel No.
Age: …… … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … ….
Number of spouses: …… … … … … … … … … … … … … … … … … … … … … … … … … … … ….
Pregnant? Y/N/NA: …… … … … … … … … … … … … … … … … … … … … … … … … … … … ….

Service rendered: …… … … … … … … … … … … … … … … … … … … … … … … … … … … ….

Other remarks: …… … … … … … … … … … … … … … … … … … … … … … … … … … … … ….

Name: …… … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … ….
Title: …… … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … ….
Signature: …… … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … ….
Date and Official stamp: …… … … … … … … … … … … … … … … … … … … … … … … … … … …….

( Please tear along this line)

GENERAL CLIENT REFERRAL FORM (FEEDBACK)

PLEASE RETURN THIS PART OF THE FORM TO: …… … … … … … … … … … … … … …
Address: …… … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … ….

Age: …… … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … ….

Date Service was offered: …… … … … … … … … … … … … … … … … … … … … … … … … … … … ….

Name: …… … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … ….
Title: …… … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … ….
Signature: …… … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … … ….
Date and Official stamp: …… … … … … … … … … … … … … … … … … … … … … … … … … … …….

---

TB/HIV SOP, version for field testing – Tanzania, 2008 14
The following is a generic referral form to be used by CTC to transfer/refer the PLHIV to another CTC unit.

<table>
<thead>
<tr>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: First</td>
</tr>
<tr>
<td>Date of birth:</td>
</tr>
<tr>
<td>Reason for referral:</td>
</tr>
<tr>
<td>ART nurse assigned:</td>
</tr>
<tr>
<td>Clinical stage:</td>
</tr>
<tr>
<td>Current status:</td>
</tr>
<tr>
<td>Clinical score:</td>
</tr>
</tbody>
</table>
| TB: Status: 
| 1st tuberculosis: new | Yes | No |
| Other relevant medical conditions: Yes | No |
| Drug allergies: Yes | No |
| Other relevant clinical notes: |
| Name, signature and stamp: |

**FEEDBACK SECTION**

Satisfied: 
Not satisfied: 
Date of birth/age: 
Date of follow-up: 
Additional comments: 

**Name of Organization/Health Facility:** CONTACT PERSON/Infectious Disease specialist: 
Name: 
Designation: 
Mobile Tel No: 

TB/HIV SOP, version for field testing – Tanzania, 2008
If a TB patient is identified to be HIV positive at the TB clinic, he/she has to be referred to the CTC using this TB transfer/referral form of NTLP/MOHSW.
HIV rapid test should be always available at the TB clinic and it should be under the quality assurance system of the MOHSW.

The HIV rapid test to be used includes: test 1 Bioline, test 2 Determine to confirm if Bioline positive, test 3 (tie breaker) Unigold to confirm if Determine negative.

5. ISONIAZID PREVENTIVE THERAPY (IPT)
IPT should be provided in selected and accredited health facilities only.

5.1 IPT Eligibility criteria
Any PLHIV who screen negative for the TB screening questionnaire or negative for TB diagnostic test (sputum and/or CXR) is potentially eligible for IPT.

Inclusion criteria
Any person fulfilling the following criteria is eligible for IPT:
- A documented HIV positive status
- Fifteen years (15 years) and above
- Those who do not meet any of the exclusion criteria

Exclusion criteria
Any person with any of the following criteria is not eligible for IPT:

- **TB suspect/patient with confirmed active TB disease**
- **Patient currently on TB treatment or patient with history of completed TB treatment/IPT in less than 2 years (either documented or self-reported)**
- **Patient with history of completed MDR TB treatment (either documented or self-reported)**
- **Medical contraindications to INH (either documented or self-reported and either current or prior)**
  - Intolerance/allergy to INH
  - Chronic/acute liver disease
- **Alcohol abuse**
- **Poor compliance/adherence for chronic medications**
- **Terminal AIDS stage 4 (as defined by WHO palliative care guidelines)**
- **Persons who are highly unlikely to complete the prophylaxis (e.g. homeless or short term migrants)**

### 5.2 IPT counseling

Patients eligible for IPT should be counseled on the following aspects:

- **What is TB and difference between TB disease & TB infection**
• Relationship between TB and HIV
• Potential benefits IPT
• Duration and dose of IPT
• Possible adverse events, warning signs to identify them and how minimize side effects (e.g. use of pyridoxine)
• Importance of compliance and adherence
• Assessment of patient’s readiness to start IPT

5.3 Dose and duration
• Patients eligible for IPT and accepting IPT would be started on 300 mg INH per day. Patients weighing less than 30 Kg, the dose of INH will be given 5mg/Kg.
• IPT should be provided for 6 months. Patients will be given monthly supply of IPT during their follow up visits.
• The patients will also be given monthly supply of 25 mg of pyridoxine every day to reduce the occurrence of peripheral neuropathy. The dose of pyridoxine may be increased up to 100 mg per day if the person experiences persistent peripheral neuropathy.
• Patients completing a course of IPT would be eligible for IPT after two years.

5.4 Adverse reaction and management
All patients should be counseled and educated about potential adverse reactions associated with INH at initial counseling and at each follow up visit. The following table summarizes the most common INH associated minor and major adverse reactions and its management.

<table>
<thead>
<tr>
<th>Adverse events</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mild</strong></td>
<td></td>
</tr>
<tr>
<td>- Tingling/ burning sensation</td>
<td>Continue with INH, reassurance and reassessment</td>
</tr>
<tr>
<td>- Joint pain</td>
<td></td>
</tr>
<tr>
<td>- Mild skin rash</td>
<td></td>
</tr>
<tr>
<td>- Peripheral neuropathy</td>
<td></td>
</tr>
<tr>
<td>- Abdominal pain</td>
<td></td>
</tr>
<tr>
<td><strong>Severe</strong></td>
<td></td>
</tr>
<tr>
<td>- Hepatitis/ jaundice</td>
<td>STOP INH and refer for further management</td>
</tr>
<tr>
<td>- Severe skin rash with peeling skin</td>
<td></td>
</tr>
<tr>
<td>- Disabling peripheral neuropathy</td>
<td></td>
</tr>
<tr>
<td>- Convulsions</td>
<td></td>
</tr>
</tbody>
</table>

► If liver function test is available, discontinue INH when serum Aspartate Amino Transaminase and serum Alanine Amino Transaminase (AST/ALT) exceeds three to five times the upper limit (normal AST/ALT: 50 U/L).
Follow up visits
Each month the patient should be:
• assessed for IPT adherence, by self-reporting drug intake
• assessed for any signs of adverse events
• screened for TB using the TB screening questionnaire

5.5 Recording & reporting
The CTC staff should record INH into the TB status column of the CTC-2 card and should record the date IPT was started/completed in the pre-ART and ART registers. Selected and accredited HFs should report on proportion of newly registered patients started on IPT by using a specific reporting format.

5.6 Estimating drug requirements for IPT
The quarterly INH needs estimation to start the IPT programme has to be based on:
− total number of PLHA registered in the pre-ART register minus global estimate of 15% with active TB minus estimated 30% not eligible

Once a facility starts implementing IPT, the quarterly INH needs estimation to continue IPT programme has to be based on the following:
− Previous quarter consumption plus one month buffer stock

or
− Previous quarter received minus INH still available in stock plus one month buffer stock

Pyridoxine has to be ordered in the same quantity as INH.
The pharmacist should keep a dispensing record of INH & Pyridoxine similar to the other drugs. The facilities will calculate the requirements for INH and pyridoxine as explained above and send it the DMO office as other supplies.

5.7 Roles and responsibilities of staff at CTC

Registration Nurse:
− Administration of TB screening questionnaire to all PLHA at enrolment and follow up (TB questionnaire is incorporated into the IPT record form)
− Keep the IPT record form attached to the CTC2 card
− Refer any TB suspect to laboratory for sputum examination using the sputum request form
− Update CTC2 “TB status” according to coding system
− Refer to counsellor for adherence counselling sessions to assess readiness to start IPT and
for on going continuum of education after start IPT
- Update "INH column" into the pre-ART/ART register
- Evaluate side effects at every monthly visit and refer to clinician if any complication
- Update the IPT record if the patient does not report complications

Counsellors:
- Conduct adherence counselling sessions to assess readiness to start IPT and on going continuum of education after start IPT
- Evaluate adherence at every monthly visit and refer to clinician if any complication

Where registration nurse and counsellor are the same person, this person is responsible to accomplish all the tasks.

Clinician:
- Physical examination and history collection
- Assess IPT eligibility
- Fill/update new IPT record form
- Evaluate for adherence and side effects and stop IPT if necessary
- Prescribe the first monthly INH supply
• Refer to TB clinic if active TB case to start TB Rx

Pharmacist:
• Counsel the patient on adherence and side effects
• Dispense and record monthly INH and pyridoxine supply
• Order quarterly INH and pyridoxine supply

Laboratory personnel:
• Ensure sputum results are timely reported to the patient or the CTC

6. RESPIRATORY SYNDROMES AND DIFFERENTIAL DIAGNOSIS
6.1 Cough or difficult breathing

<table>
<thead>
<tr>
<th>Differential Diagnosis</th>
<th>In favour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common cold/bronchitis</td>
<td>• Short history</td>
</tr>
<tr>
<td></td>
<td>• Normal CXR</td>
</tr>
<tr>
<td></td>
<td>• No difficult breathing</td>
</tr>
<tr>
<td></td>
<td>• No or mild fever</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>• Short history</td>
</tr>
<tr>
<td></td>
<td>• Fever</td>
</tr>
<tr>
<td></td>
<td>• Responds to antibiotics</td>
</tr>
<tr>
<td></td>
<td>• Unilateral effusion</td>
</tr>
</tbody>
</table>

TB/HIV SOP, version for field testing – Tanzania, 2008
<table>
<thead>
<tr>
<th>Condition</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuberculosis</td>
<td>- Chronic cough</td>
</tr>
<tr>
<td></td>
<td>- Fever</td>
</tr>
<tr>
<td></td>
<td>- Weight loss</td>
</tr>
<tr>
<td></td>
<td>- Haemoptysis</td>
</tr>
<tr>
<td></td>
<td>- Unilateral Effusion</td>
</tr>
<tr>
<td></td>
<td>- Night sweats</td>
</tr>
<tr>
<td></td>
<td>- Exposure to someone with TB</td>
</tr>
<tr>
<td></td>
<td>- Blood stained sputum</td>
</tr>
<tr>
<td>Lung abscess</td>
<td>- Cough with large amounts of purulent sputum</td>
</tr>
<tr>
<td></td>
<td>- Abscess with fluid level on CXR</td>
</tr>
<tr>
<td></td>
<td>- Ruptured amebic liver abscess</td>
</tr>
<tr>
<td>Bronchiectasis</td>
<td>- Cough with large amounts of purulent sputum</td>
</tr>
<tr>
<td></td>
<td>- Responds to antibiotics</td>
</tr>
<tr>
<td>Pneumocystis pneumonia</td>
<td>- Dry cough and dyspnoea</td>
</tr>
<tr>
<td></td>
<td>- Fever</td>
</tr>
<tr>
<td></td>
<td>- Nasal flaring</td>
</tr>
<tr>
<td></td>
<td>- Marked tachypnoea dyspnoea</td>
</tr>
<tr>
<td></td>
<td>- Spontaneous Pneumothorax</td>
</tr>
<tr>
<td></td>
<td>- CXR with bilateral diffuse interstitial shadowing</td>
</tr>
<tr>
<td>Histoplasmosis</td>
<td>- Marked fever and weight loss</td>
</tr>
<tr>
<td></td>
<td>- Mild or no respiratory symptom</td>
</tr>
<tr>
<td></td>
<td>- CXR with bilateral diffuse interstitial shadowing</td>
</tr>
<tr>
<td></td>
<td>- Enlarged liver and spleen</td>
</tr>
<tr>
<td>Condition</td>
<td>Symptoms</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Enlarged lymph nodes</td>
<td></td>
</tr>
<tr>
<td>Insidious onset</td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>Intermittent symptoms, generalized wheezing</td>
</tr>
<tr>
<td></td>
<td>Nocturnal symptoms</td>
</tr>
<tr>
<td>Heart Failure</td>
<td>Tachypnoea,</td>
</tr>
<tr>
<td></td>
<td>Paroxysmal nocturnal dyspnoea</td>
</tr>
<tr>
<td></td>
<td>Haemoptysis</td>
</tr>
<tr>
<td></td>
<td>Hepatic congestion,</td>
</tr>
<tr>
<td></td>
<td>Peripheral edema,</td>
</tr>
<tr>
<td></td>
<td>Bilateral pulmonary effusion</td>
</tr>
<tr>
<td></td>
<td>Palpitations and/or elevated Jugular venous pressure (JVP)</td>
</tr>
<tr>
<td>Bronchial carcinoma</td>
<td>Risk factors (smoking, older age, previous mine work)</td>
</tr>
<tr>
<td>Chronic obstructive</td>
<td>No fever Risk factor (smoking)</td>
</tr>
<tr>
<td></td>
<td>Chronic symptoms generalized pulmonary disease</td>
</tr>
<tr>
<td></td>
<td>wheezing, dyspnoea</td>
</tr>
<tr>
<td></td>
<td>Right heart failure</td>
</tr>
<tr>
<td></td>
<td>Intermittant onset</td>
</tr>
<tr>
<td></td>
<td>History of smoke exposure</td>
</tr>
<tr>
<td></td>
<td>Older age vs young age (asthma)</td>
</tr>
<tr>
<td>Pneumothorax</td>
<td>Sudden onset</td>
</tr>
<tr>
<td></td>
<td>Hyperresonance on percussion on one side</td>
</tr>
<tr>
<td></td>
<td>Diminished or absent breathing on</td>
</tr>
</tbody>
</table>
### 6.2 Chest pain

<table>
<thead>
<tr>
<th>Pneumonia</th>
<th>Pneumothorax</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Cough with fast breathing</td>
<td>- Acute onset</td>
</tr>
<tr>
<td>- Fever</td>
<td>- Hyper-resonance on physical exam</td>
</tr>
<tr>
<td>- Coarse crackles on auscultation</td>
<td>- Severe shortness of breath</td>
</tr>
<tr>
<td>- Productive cough</td>
<td>- Pleural rub</td>
</tr>
<tr>
<td>- Acute onset</td>
<td>- Tracheal deviation (if severe)</td>
</tr>
<tr>
<td>- Pleuritic chest pain</td>
<td></td>
</tr>
<tr>
<td>- Focal lung exam</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Acute allergic condition (anaphylaxis)</th>
<th>Pleural effusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Very acute onset</td>
<td>- Dull to percussion</td>
</tr>
<tr>
<td>- Known allergy</td>
<td>- Reduced breath sounds</td>
</tr>
<tr>
<td>- Skin rash</td>
<td>- Pleural rub</td>
</tr>
<tr>
<td>- Angioedema</td>
<td>- Chest x-ray shows fluid</td>
</tr>
</tbody>
</table>

- Subcutaneous emphysema

- Pleural effusion
- Dull to percussion
- Reduced breath sounds
- Pleural rub
- Chest x-ray shows fluid

- Pleural rub
- Dull to percussion
- Reduced breath sounds
- Pleural rub
- Chest x-ray shows fluid

- Pleural rub
- Dull to percussion
- Reduced breath sounds
- Pleural rub
- Chest x-ray shows fluid
<table>
<thead>
<tr>
<th>Condition</th>
<th>Symptoms</th>
</tr>
</thead>
</table>
| Pleuritis          | • Pleuritic pain  
                    • Pleural rub                                                               |
| Pericarditis       | • Acute onset  
                    • Pericardial friction rub  
                    • Positional pain (worse with leaning forward)  
                    • Typical ECG findings (Diffuse ST-T changes) |
| Coronary syndromes | • History of known heart disease  
                    • Associated with exertion  
                    • Pain radiating to the arm or jaw  
                    • Associated with nausea and diaphoresis  
                    • Typical ECG findings (Localized ST-T changes)  
                    • History of trauma  
                    • Radiological findings  
                    • Tenderness of palpation |
| Esophagitis        | • Pain on swallowing  
                    • Retrosternal pain  
                    • History of gastritis  
                    • Presence of oropharyngeal lesions |
6.3 Pneumonia
The most common type of pneumonia is bacterial in HIV-positive and negative patients. This type of pneumonia is usually acute in onset, while others may be slower in onset.

Pneumonia can be classified into two types on clinical grounds:
- Severe pneumonia → to be managed as an inpatient
- Non-severe pneumonia→ to be managed as an outpatient

a. Severe pneumonia

Diagnosis
At least one of the following signs is an indication that the patient is severely ill and should be treated as an inpatient:
- Very fast breathing (> 30 in an adult, >40 if 5-12 years old)
- High fever >39°C
- Pulse > 120
- Unable to walk unaided

Additional signs:
- Retractions or labored breathing
- On auscultation, signs include decreased breath sounds (sign of consolidation), crackles, bronchial breath sounds, or a pleural rub.

*If HIV-positive patients → send sputum for AFB regardless of duration of symptoms*

In bacterial pneumonia, the chest x-ray can show:
- consolidation or infiltrates
- Sometimes it can show cavities
- pleural effusion, which is a complication of pneumonia
- usually abnormal on one side only

| Severe heart failure can also present acutely with cough and difficulty breathing. However, the CXR usually show bilateral infiltrates in the lower lung fields and/or bilateral pleural effusions. |

**Treatment**
Admit the patient to the hospital.
Note: it is not recommended to use a quinolone because this may mask underlying tuberculosis.

Discharge to go home when patient is able to walk and eat.

If the patient is HIV-positive, treat for PCP (see next section).

If sputum is positive for AFB, treat for tuberculosis (see next section)

If patient is HIV-positive and not improving after 3-5 days, consider empiric TB treatment even if sputum is negative for AFB.
Patients with pulse oximetry less than 90% should receive oxygen via nasal cannula.

**Monitoring**
Check the patient every 4 hours.

**Complications**
If the patient does not seem to improve, check another CXR and repeat the history and physical examination. Assess for the following complications:

- **Empyema**: Failure to improve and persistent fever may be signs of an infected pleural effusion (empyema). Check the CXR and drain fluid if an effusion is visible (see section on pleural effusion).
- **Acute heart failure**: Patients with weak heart (low ejection fraction) or patients with anemia can be pushed into an episode of heart failure because of the stress of pneumonia.
- **Tuberculosis**: If the patient does not improve, the patient might have TB. Also, HIV-positive patients may have concomitant bacterial pneumonia and tuberculosis. Send 2 sputums for AFB if not done previously. Check patient again for signs of disseminated TB (meningitis, lymphadenopathy or peritonitis).
any of these signs exist, start TB treatment empirically while investigations are pending.

b. Non-severe pneumonia

Diagnosis
Clinical signs of pneumonia will include:
– Fast breathing (> 20 in an adult, > 30 if 5-12 years old)
– Night sweats
– Chest pain

• On auscultation, signs include crackles, bronchial breath sounds, or a pleural rub on one side.

• The CXR can show consolidation, infiltrates or subtle abnormalities that are difficult to see.

If HIV-positive patients → send sputum for AFB regardless of duration of symptoms

Treatment
If one of the following conditions applies:
– second/third trimester pregnancy
– HIV clinical stage 4
– low CD4 count
– chronic disease
– over 60 years of age
– suspected or known HIV infection

→ hospitalize the patient and treat as a severe pneumonia.

Otherwise, follow the algorithm:

```
- Fast breathing (> 20 in an adult, > 30 if 5-12 years old)
- Night sweats
- Chest pain
```

- Chest x-ray shows consolidation or infiltrates
- Chest x-ray shows no abnormality

```
Treat the patient for typical bacterial pneumonia with a 5-day course of amoxicillin.
Treat the patient for atypical bacterial pneumonia with a 5-day course of azithromycin.
```

**Follow-up**
Assess the patient after 2 days. If breathing rate and fever are the same, check CXR and send 2 sputum samples for AFB (if not already done). Otherwise, change to second-line antibiotic such as doxycycline and continue treatment as an outpatient.
c. Cough/cold or bronchitis
These are common viral infections that do not need any antibiotics.

Diagnosis
- Cough
- Nasal discharge
- Fever

Patients do not have fast breathing, high fever or inability to walk.

Treatment
Treat as an outpatient
- Do not give antibiotics or other patent medicines
- Give symptomatic paracetamol for maximum 2 weeks; if not improve, review the diagnosis and check for pneumonia and tuberculosis

6.4 Pleural effusion
One of the most common causes of pleural effusion is bacterial pneumonia or TB. A pleural effusion is often visible on CXR on the same side as the pneumonia. A common cause of bilateral pleural effusions is heart failure. A less common cause of a one-sided effusion is malignancy.
**Diagnosis**
- Dull to percussion
- Reduced breath sounds
- A pleural rub may be heard before the effusion is fully developed
- Chest x-ray shows fluid

Send sputum for AFB/culture. Pleural effusion is very common in HIV-positive patients with pulmonary TB compared to HIV-negative patients.

If the patient does not have obvious signs of pneumonia, heart failure or TB, tap the pleural effusion and send a small sample to the laboratory for protein and glucose, cell count and differential, gram stain and AFB, bacterial and TB culture.

Management depends on the characteristics of the pleural fluid.
### Differential diagnosis of pleural effusion

<table>
<thead>
<tr>
<th></th>
<th>History and physical examination</th>
<th>CXR</th>
<th>Fluid</th>
<th>Laboratory analysis of pleural fluid</th>
</tr>
</thead>
</table>
| **Bacterial pneumonia** | • Cough  
• Fever  
• Acute onset | Unilat  | • Cloudy and purulent  
• Rarely clear and straw colored | • Protein > 3 g/L (exudate)  
• Low glucose  
• Markedly elevated WBC (neutrophils) |
| **TB**         | • Weight loss, night sweats, fever  
• Sputum AFB  
• Evidence of TB in other sites (including the lung) | Unilat  | • Clear and straw colored  
• Clots on standing in a tube without anticoagulants | • Protein > 3 g/L (exudate)  
• Sometimes elevated WBC (lymphocytes) |
| **Malignancy** | • Smoking  
• Asymptomatic  
• Weight loss  
• Evidence of | Unilat  | • Bloody or frothy | • Protein > 3 g/L (exudate)  
• Cytology positive |
<table>
<thead>
<tr>
<th>Malignancy in other organ systems (KS, lymphoma)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heart/renal failure</strong></td>
<td>• Cough, orthopnea, peripheral oedema</td>
<td>• Clear and straw coloured</td>
</tr>
<tr>
<td>Bilat</td>
<td>• Doesn't clot</td>
<td>• Protein &lt; 3 g/L (transudate)</td>
</tr>
</tbody>
</table>
If diagnosis is unclear, consider empiric treatment for TB.

**Treatment**
- A small pleural effusion due to pneumonia does not need to be drained: it will go away with antibiotics
- If it is large or infected (empyema), drain the effusion using a chest tube
- Bilateral effusions due to heart failure do not need to be drained.

**6.5 Pneumocystis pneumonia**

Pneumocystis pneumonia (PCP) is caused by a fungus, formerly known as *Pneumocystis carinii*, which presents only in immuno-compromised patients.

**Diagnosis**

Typical features of *Pneumocystis* pneumonia on examination include:
- Fever
- Dry cough
- Dyspnoea with unremarkable auscultatory findings
- CXR may reveal diffuse interstitial infiltrate but may also be normal
**Treatment**

- **Mild to moderate disease (fast breathing, under 30x minute):** Cotrimoxazole 160-800mg (15mg/kg TMP) 1-2 tablets three times a day for 21 days

- **Severe disease (very fast breathing, over 30x minute):** Cotrimoxazole 160-800mg (15mg/kg TMP) 1-2 tablets three times a day for 21 days

→ *Prednisone (1mg/kg) until clinical improvement and lower dose gradually afterwards*

All patients with severe disease or severe disease (nasal flare onset, increased breathing rate) will need:
- oxygen and in most cases for no less than a week
- steroids orally or intravenously to diminish life threatening inflammatory response

**Monitoring**

Patients with *Pneumocystis* pneumonia should always be monitored closely and in severe disease at least every 4 hours until clinical improvement (decreased breathing rate, less chest wall retractions, less respiratory distress that allows for food intake).
Complications
Spontaneous pneumothorax is can happen with PCP so monitor clinically or obtain chest x-ray.

Prevention and follow up
Cotrimoxazole prophylaxis (160-800 mg 1 tablet a day) should be prescribed in known or suspected HIV patients with severe immunodeficiency (CD4 count < 200 cells-mm³ or WHO stage 3 and 4) to prevent disease and after recovery to prevent relapses.

6.6 Histoplasmosis
Histoplasmosis is a fungal systemic disease in advanced AIDS patients (CD4 count < 50 cells-mm³); onset is usually subacute and insidious.

Diagnosis
- Fever
- Weight loss
- Lymphadenopathy
- Hepatosplenomegaly

Treatment
- Mild to moderate disease: Itraconazole 300 mg twice a day with food for 3 days as a
loading dose followed by 200 mg twice a day with food for 3 months.

- **Severe disease (prostration, cachexia):**
  Amphotericin B (0.7mg-kg) I.V. 7-10 days followed by Itraconazole 200 mg twice a day with food for 3 months.

**Complications**
- Respiratory distress
- Sepsis-like shock
- Anemia
- Reversible nephrotoxicity

**Prevention and follow up**
Suppression therapy with itraconazole in similar dosing as in treatment may be necessary until immune restoration is achieved or at least until CD4 counts are over 150 cells/mm$^3$ through ARV therapy.

**7. TUBERCULOSIS**
- The most cost effective method of detecting TB cases is sputum smear microscopy
- HIV testing should be offered along with a sputum smear to every tuberculosis suspect
- Two sputum samples for microscopy are indicated for diagnosis (*spot and morning*)
CXR is highly recommended to support the diagnosis of smear-negative pulmonary TB. CXR should be done early in the course of investigation of a TB suspect. The following algorithm for TB diagnosis from NTLP/MOHSW applies to any TB suspects regardless from the HIV status.

1. **Patient suspect for TB**

2. **2 AFB sputum samples for smear microscopy (spot and morning) and offer PITC**

   - **1 or 2 sputum smears AFB**
     - CXR suggestive and clinical judgment suggestive for TB
       - Treat for TB
       - TB likely
     - No improvement and HIV positive
       - Reassess for TB and other Dx
     - Improvement: TB unlikely
   - **2 sputum smears AFB negative**
     - If HIV positive: request CXR, clinical assessment
     - If HIV negative or PITC refused: clinical assessment
     - No improvement and HIV negative
       - Provide broad spectrum antibiotics and assess after 7 days
     - If HIV positive:

TB/HIV SOP, version for field testing – Tanzania, 2008
Note: Antibiotics (except fluoroquinolones) to cover both typical and atypical bacteria should be considered

7.1 Understand the differential diagnosis of smear-negative pulmonary TB
An HIV-patient suspect of TB with 2 negative sputum smears may not have TB. Always reassess the patient for conditions that may be mistaken for TB, including non-infectious conditions.
### PTB and PCP in relation to HIV stage

<table>
<thead>
<tr>
<th>Pulmonary TB</th>
<th>Stage of HIV-infection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HIV clinical stage (1-2)</td>
</tr>
<tr>
<td></td>
<td>CD4 &gt; 200</td>
</tr>
<tr>
<td>Clinical picture</td>
<td>▪ Cough ≥ 2 weeks</td>
</tr>
<tr>
<td></td>
<td>▪ Productive sputum</td>
</tr>
<tr>
<td>CXR appearance</td>
<td>▪ Upper lobe infiltrates</td>
</tr>
<tr>
<td></td>
<td>▪ Cavitation</td>
</tr>
<tr>
<td></td>
<td>▪ Nodular or patchy shadows</td>
</tr>
<tr>
<td>Sputum smear</td>
<td>▪ Often positive (&gt;80%)</td>
</tr>
</tbody>
</table>

#### Pneumocystis Pneumonia

<table>
<thead>
<tr>
<th>Clinical picture</th>
<th>Unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>CXR appearance</td>
<td>▪ Bilateral diffuse infiltrates</td>
</tr>
<tr>
<td></td>
<td>▪ May be normal</td>
</tr>
<tr>
<td>Laboratory</td>
<td>▪ Spontaneous pneumothorax</td>
</tr>
<tr>
<td></td>
<td>Not useful</td>
</tr>
</tbody>
</table>

TB/HIV SOP, version for field testing – Tanzania, 2008
7.2 Extra-pulmonary TB (EPTB)

The common forms of EPTB associated with HIV are

- Lymph adenopathy
- pleural effusion
- abdominal
- pericardial disease
- miliary TB
- meningitis

If a patient has EPTB, look for pulmonary TB with sputum smears and CXR but keep in mind that many patients with EPTB do not have coexisting pulmonary TB.

► Patients will present with constitutional symptoms (fever, night sweats, weight loss) and local features related to the site of the disease. Often diagnosis is based on clinical judgment.

8. TB AND HIV CO-TREATMENT

It is highly recommended to adhere to the following criteria for deciding when to start ART in patient with TB before commencing ART. In patients with HIV-related TB the priority is to treat the TB. When indicated, ART should not be delayed.
<table>
<thead>
<tr>
<th>CD4</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD4 &gt; 350</td>
<td>Treat TB first, re-asses for ART after completion of TB treatment (if PTB: re-check CD4; if EPTB start ART regardless of CD4 count)</td>
</tr>
<tr>
<td>CD4 200 – 350</td>
<td>Treat TB first for two month before starting ART</td>
</tr>
<tr>
<td>CD4 &lt; 200 or CD4 &lt; 15% or WHO HIV stage 4</td>
<td>Begin ART as early as 2 weeks after TB treatment initiation</td>
</tr>
</tbody>
</table>
Anti-TB regimens in PLHIV are the same as in HIV-negative patients.

<table>
<thead>
<tr>
<th>Disease site</th>
<th>Laboratory results</th>
<th>Type of patient</th>
<th>Recommended treatment category</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTB</td>
<td>Sputum smear-positive</td>
<td>New</td>
<td>CAT I</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Relapse</td>
<td>CAT II</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Treatment after failure</td>
<td>CAT II</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Treatment after default</td>
<td>Usually CAT II</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chronic or MDR-TB*</td>
<td>CAT IV</td>
</tr>
<tr>
<td></td>
<td>Sputum smear-negative</td>
<td>CAT I or III c</td>
<td>CAT I or III c</td>
</tr>
<tr>
<td>EPTB</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* MDR-TB: tuberculosis strain resistant to isoniazid and rifampicin
8.1 A patient developing TB while on ART

Antiretroviral therapy should be continued throughout TB treatment, with changes as follows:

- **First line drugs**: Substitute Nevirapine for Efavirenz. If this is not possible (e.g. intolerant of Efavirenz or significant risk of falling pregnant) Nevirapine may be substituted with Abacavir or Saquinavir/Ritonavir.

- **Second line drugs**: Lopinavir/Ritonavir should be changed to Saquinavir/Ritonavir (dose: 400/400 mg every 12 hours – 3 extra caps of Ritonavir). This should be continued until 2 weeks after completion of TB treatment when the extra Ritonavir can be stopped.

In general the development of an episode of pulmonary TB after 6 months of ART, without other clinical and immunological evidence of disease progression, should not be regarded as representing ART failure. However, if there is evidence of clinical/immunological failure and the patients has EPTB other than lymph node TB, the possibility of ART failure has to be considered.

*In pregnant women living with HIV and who have TB, the first priority is to treat the TB.*
# If a pregnant woman receiving ART develops TB, such therapy should be continued
# If a woman is in the second or third trimester of pregnancy, an EFV-based ART regimen can be considered
# Changing back from an EFV-based to NVP-based ART regimen could be considered once the TB treatment is completed and if the woman is still pregnant
# NVP-based regimens can be started during the continuation phase of TB treatment, only if the TB regimen in this phase does not include rifampicin

<table>
<thead>
<tr>
<th>Choose the appropriate TB-ART co-treatment regimen for pregnant women</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scenario</strong></td>
</tr>
<tr>
<td>If there is indication to start ART within the first trimester</td>
</tr>
<tr>
<td>If it is possible to defer ART until the end of first trimester</td>
</tr>
</tbody>
</table>

8.2 *Indications and management of empirical TB treatment*

- Empirical anti-TB therapy can be prescribed while awaiting the results of smears, cultures and histologic examination or may be prescribed when a clinical decision to treat has been made.
- Empirical TB treatment should come after the most extensive diagnostic work up possible has ruled out other explanations and should happen after the best clinical assessment in a particular epidemiologic context.
- The proper way to conduct empirical therapy requires hospitalization that will allow for identifying emerging signs and symptoms as well as side effects of the medication.
- Empiric trials of treatment with incomplete regimens of anti-TB drugs should not be practiced. If a patient is treated with empiric anti-TB drugs, treatment should be with standardized first-line regimens for the entire duration of TB treatment. Empiric treatment should only be stopped if there is bacteriological, histological, or strong clinical evidence of an alternative diagnosis.

### 8.3 Management of adverse reaction to anti-TB drugs

The following table summarizes the adverse reactions of TB treatment and ART and the management options.
<table>
<thead>
<tr>
<th>Signs or symptoms</th>
<th>Management</th>
</tr>
</thead>
</table>
| Anorexia, nausea, abdominal pain and/or diarrhea | - Take drugs with food and re-hydrate  
- If on ZDV, reassure that this is self-limited. Treat symptomatically  
- If on INH, give the TB drug at bedtime |
| Fatigue and/or pallor and/or anemia     | - Consider anemia especially if on ZDV and check hemoglobin  
- Fatigue commonly lasts 4-6 weeks especially when starting ZDV. If severe or longer than this: refer to the expert  
- If severe pallor or symptoms of anemia or hemoglobin <8 gr, stop ZDV and refer to the expert |
| Anxiety and/or nightmares               | - This may be due to EFV and it usually lasts < 3 weeks. Give drug at night and counsel  
- If it lasts > 3 weeks or severe depression or suicidal or psychosis, refer to the expert |
| Itching of skin and/or skin rash        | - If generalized or peeling, stop TB and ART drugs and refer to an expert  
- If dry or wet lesions refer to an expert  
- If on NVP, assess carefully for allergic reaction |
<table>
<thead>
<tr>
<th>Symptom</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deafness</td>
<td>Stop TB and ART drugs</td>
</tr>
<tr>
<td>Dizziness</td>
<td></td>
</tr>
<tr>
<td>Jaundice</td>
<td></td>
</tr>
<tr>
<td>Vomiting repeatedly</td>
<td></td>
</tr>
<tr>
<td>Difficulty with vision</td>
<td></td>
</tr>
</tbody>
</table>
| Fever | − This could be a side effect of ART  
− Check for common causes of fever  
− It could be also an opportunistic infection or other new infection or immune reconstitution syndrome. In that case, refer to the expert |
| Cough and/or difficult breathing | − This could be immune reconstitution syndrome: in that case, refer to the expert |
| Lymph adenopathy | |
When it is not known which drug was responsible for the reaction the table below shows the standard approach to reintroducing anti-TB drugs and finding the culprit.

### Reintroduction of TB Drugs following Drug Reactions

<table>
<thead>
<tr>
<th>Drug</th>
<th>Likelihood of causing a reaction</th>
<th>Challenge doses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Day 1</td>
</tr>
<tr>
<td>Isoniazid</td>
<td>Least likely</td>
<td>50 mg</td>
</tr>
<tr>
<td>Rifampicin</td>
<td></td>
<td>75 mg</td>
</tr>
<tr>
<td>Pyrazinamide</td>
<td></td>
<td>250 mg</td>
</tr>
<tr>
<td>Ethambutol</td>
<td></td>
<td>100 mg</td>
</tr>
<tr>
<td>Streptomycin</td>
<td></td>
<td>125 mg</td>
</tr>
</tbody>
</table>
If possible, while the patient is undergoing drug challenge, give two anti-TB drugs that the patient has not had before. Drug challenge starts with isoniazid, the one anti-TB drug least likely to be responsible for the reaction. The initial small challenge dose allows for a less severe reaction than with a full dose. Repeat the procedure adding in one drug at a time until a reaction after a particular drug is added will identify the responsible drug.

If the drug responsible for the reaction is Pyrazinamide, Ethambutol or streptomycin, resume anti-TB treatment without the offending drug. If possible replace it with another drug. Consider the start of the resumed regimen as a new start of treatment. This prolongs the total time of TB treatment but decreases the risk of recurrence.

**Desensitization**

Rarely patients develop hypersensitivity reactions to the two most potent anti-TB drugs, Isoniazid and Rifampicin. These drugs form the cornerstone of short course chemotherapy.
Desensitization in TB/HIV patients needs very careful consideration because of the high risk of serious toxicity

- Start the desensitization with a tenth of the normal dose.
- Then increase the dose by a tenth of a normal dose each day, until the patient has the full dose on the tenth day.
- Once drug sensitization is over, give the drug as part of the usual treatment regimen.
- If possible while carrying out desensitization, give the patient two anti-TB drugs that he or she has not had before. This is to avoid the risk of drug resistance developing during desensitization.

8.4 Referrals for diagnostic uncertainty or complications of TB

TB/HIV co-infected patients should be referred to higher health facility level (e.g. from district to regional hospital) in the following situations:

- Complications in the course of TB that cannot be managed at district level
- Diagnostic uncertainty and/or lack of appropriate diagnostic tools
- Absence of specific drugs for treatment of HIV-related opportunistic infections
- Major side effects or severe IRIS which do not respond to the first line treatment
- Suspect Drug Resistant TB
- Severely ill patient failing standard district-level management.

Once stabilized and a treatment plan determined, the patient can be referred back to the district level assuming that appropriate care can be guaranteed at that time.

### 8.4.1 Suspected TB drug resistance

The following elements of the medical history suggest an increased risk for drug resistance:
- Failure of re-treatment Category II regimen and chronic TB cases
- Exposure to a known MDR case
- Failure of Category I
- Relapse and return after default
- Patients who remain sputum smear positive at 2-3 month
- Residence in area with documented high transmission of MDR TB
- History of using anti-TB drugs of unknown or poor quality
- Co-morbid condition associated with malabsorption or rapid transit diarrhea
Therefore, these patients should be referred for culture and Drug Susceptibility Testing (DST) at Muhimbili referrral hospital.

For making diagnosis of DR TB and identifying the appropriate treatment regimen, the patient should be referred to a specialized MDR-TB hospital - Kibongoto, Hai District, Kilimanjaro Region.

9. CHILDHOOD TB

The following score chart for the diagnosis of TB in children from NTLP/MOHSW should guide the HCWs in identifying TB suspects.

| To identify TB suspects among children: SCORE IF SIGN OR SYMPTOM IS PRESENT |
|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|
| GENERAL FEATURES                              | 1 | 2 | 3 | 4 | Score |
| Perceived illness                             |   |   |   |   |       |
| Fever                                          |   |   |   |   |       |
| Weight gain                                    |   |   |   |   |       |
| TB contact                                     |   |   |   |   |       |
| Malnutrition                                   |   |   |   |   |       |
| Chronic illness                                |   |   |   |   |       |
| Frequency of illness                           |   |   |   |   |       |
| Chest x-ray                                    |   |   |   |   |       |
| Enlarged nodes                                 |   |   |   |   |       |
| Nodules                                        |   |   |   |   |       |
| Previous TB contact                           |   |   |   |   |       |
| Previous history of TB                         |   |   |   |   |       |
| Previous diagnosis of TB                      |   |   |   |   |       |
| TB in family                                  |   |   |   |   |       |

<table>
<thead>
<tr>
<th>TOTAL SCORE</th>
</tr>
</thead>
</table>

TB/HIV SOP, version for field testing –Tanzania, 2008  58
The child should be assessed for any of the features above and scored according to the findings. A final score \( \geq 9 \) points is highly suggestive for TB disease. In general, consider as TB suspect any child with:

- History of unexplained weight loss or failure to grow normally
- Unexpected fever, especially lasting longer than 2 weeks
- Chronic cough
- Contact with adult with infectious TB (especially in the same household)

### 9.1 Diagnosis of TB in children

The TB diagnosis in children is based on the following tests:

- **Smear microscopy:** but <5 years age, often saliva or sputum negative
- **CXR:** the commonest picture includes persistent opacification in the lung together with enlarged hilar or subcarinal lymph glands.

The diagnosis should be made if the child has 2 or more of the following:

- Chronic symptoms suggestive of TB (weight loss, chronic cough, fever)
- Physical changes highly of suggestive of TB
- Chest radiograph suggestive of TB
However, HIV+ children often have other lung disease related to their HIV infection:
- *Pneumocystis carinii* pneumonia (PCP)
- lymphoid interstitial pneumonitis (LIP)
- viral pneumonia
- bacterial pneumonia

If the child has history of contact with PTB case, use the following algorithm:

```
Child in close contact with case of smear-positive/negative PTB

Child < 5 yrs age HIV-/- and >5yrs age HIV+
Asymptomatic
6INH
If becomes symptomatic

Child > 5 yrs age HIV-
Asymptomatic
Symptomatic
Evaluate for TB
If becomes symptomatic
No Rx

Child in close contact with case of smear-positive/negative PTB
```
9.2 TB treatment in children living with HIV

In HIV-infected children with confirmed or presumptive TB disease, initiation of TB treatment is the priority. Many clinicians will start ART 4-8 weeks after starting anti-TB treatment.

10. TB INFECTION CONTROL

This chapter describes the operating procedures to reduce the risk of *M. tuberculosis* transmission in TB and HIV health facilities. These standard operating procedures are based on:

- **Administrative measures:** which aim to reduce the risk of exposure of patients and Health Facility Staff, HFS (medical and non-medical staff working at a HF) to infectious TB cases through early diagnosis (ICF), prompt isolation or separation and prompt initiation of anti-TB treatment. The measures also include having a written TB infection control plan, patient education, training of HCWs and screening of HFS for TB.

- **Environmental measures:** aim to reduce the concentration of droplet nuclei in the air by maximizing natural ventilation or controlling the direction and rate of airflow.


- **Respiratory protection measures:** based on the use of Personal Respiratory Protection As N-95 respirators when entering MDR TB wards.

**10.1 Patients’ education**

_Triage/Registration nurse_ should conduct every hour, few minute group education on respiratory hygiene, TB screening (at CTC), HIV testing (at TB clinic) and TB/HIV co-infection.

**10.2 TB suspects separation**

- At CTC registration desk
  - actively administer the national TB questionnaire to all the PLHIV
  - refer immediately to the laboratory for sputum test those answering YES to anyone of the five questions of the TB screening questionnaire (before entering examination room)
  - Advice those coughing ≥ 2 weeks to avoid close contacts with other clients/patients, provide them with napkins and instruct on cough hygiene
- At TB registration desk and any other unit e.g. OPD/ward/RHC etc
  - actively ask about cough ≥ 2 weeks to all the non-TB patients
  - refer immediately to the laboratory for sputum test any TB suspect
- Advice those coughing ≥ 2 weeks to avoid close contacts with other clients/patients, provide them with napkins and instruct on cough hygiene

10.3 Monitoring of TB/HIV co-infected patients
The following scenarios describe the possible options for care and treatment of TB/HIV co-infected patients. The options aim to prevent the transmission of tuberculosis to PLHIV and apply to pulmonary TB cases.

- PTB/HIV patients are monitored by the CTC officer at CTC during any day/hrs other than the routine clinic days/hrs
- PTB/HIV patients are monitored jointly by TB officer and CTC officer at TB clinic
- PTB/HIV patients are monitored by TB officer at TB clinic and referred to CTC only after 3 weeks of TB treatment (this option applies only to TB officers who received an ART training course by NACP)

10.4 Ventilation
CTC and TB officer in the examination room should ensure open windows, and cross ventilation.

10.5 TB screening and HIV testing for HFS
Staff should be instructed that if signs/symptoms of TB occur (cough $\geq 2$ weeks if the HCW is HIV negative; cough $\geq 2$ weeks or fever $\geq 2$ weeks, or excessive night sweat $\geq 2$ weeks or haemoptysis or weight loss $\geq 3$ kg if the HCW is HIV positive) he/she should undergo the TB diagnostic screening (2 sputum samples and CXR as needed).

HIV testing should be encouraged, but there is no rule for mandatory HIV testing. HFS has the same rights as all individuals to confidential HIV testing and counseling, to be conducted only if there is informed consent.

10.6 Workplace restrictions

- HCW identified as having PTB disease should be removed from the unit where they are providing service, regardless of the type of department.
- Anti-TB treatment should be initiated within 24 hours of the diagnosis.
- The HCW with PTB disease should be allowed to return to work in the unit they used to work before, when they have received 3 weeks of proper TB treatment with a good clinical response.
- HFS with EPTB disease only do not need to be excluded from the workplace. They may be confirmed as non-infectious and may continue
to work based on evidence that concurrent pulmonary TB disease has been excluded.

- HCW under PEP does not need to be moved during the prophylaxis intake.
- HCW living with HIV and working at the TB clinic/MDR TB hospital/TB wards should have the option of an assignment in an area or activity that has a low risk for exposure to *M. tuberculosis*. However, this choice is an HCW personal decision.