THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF HEALTH AND SOCIAL WELFARE

Management of TB/HIV co-infected patients

Manual for Health Care Workers at TB clinics and HIV Care & Treatment Centers

National Tuberculosis and Leprosy Programme
National AIDS Control Programme
Ministry of Health and Social Welfare
Tanzania 2008

Version for field testing

TB/HIV

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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*

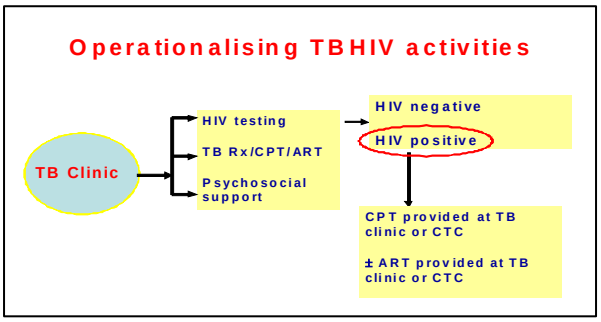
2.1 The impact of the association between HIV and TB

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

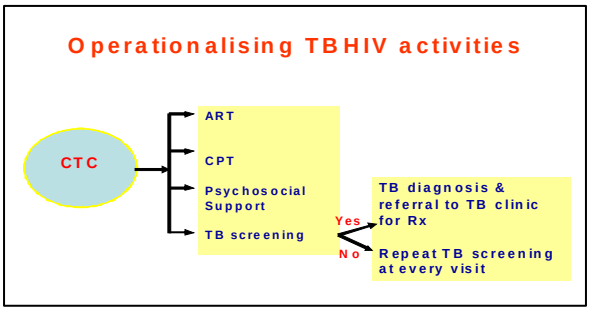
- *HIV enhance progression from TB infection to disease*
- *TB infection and disease are more difficult to diagnose among PLHIV*
- *TB disease is more difficult to treat among PLHIV*
- *Illness and mortality are increased*
- *Risk of recurrence of TB after completing treatment is increased*
- *HIV can 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 a ART course by NACP.

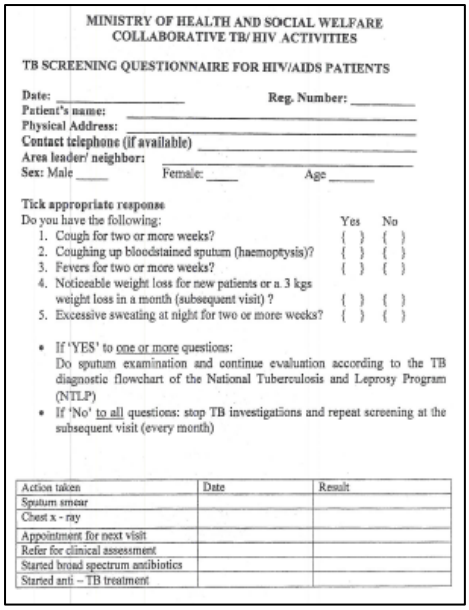


3. INTENSIFIED TB CASE FINDING: TB SCREENING AMONG PLHIV

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.



MINISTRY OF HEALTH AND SOCIAL WELFARE
COLLABORATIVE TB/ HIV ACTIVITIES

TB SCREENING QUESTIONNAIRE FOR HIV/AIDS PATIENTS

Date: _____ **Reg. Number:** _____
Patient's name: _____
Physical Address: _____
Contact telephone (if available) _____
Area leader/ neighbor: _____
Sex: Male ____ Female: ____ Age _____

Tick appropriate response

Do you have the following:	Yes	No
1. Cough for two or more weeks?	( )	( )
2. Coughing up bloodstained sputum (haemoptysis)?	( )	( )
3. Fevers for two or more weeks?	( )	( )
4. Noticeable weight loss for new patients or a 3 kgs weight loss in a month (subsequent visit) ?	( )	( )
5. Excessive sweating at night for two or more weeks?	( )	( )

- If 'YES' to one or more questions:
  Do sputum examination and continue evaluation according to the TB diagnostic flowchart of the National Tuberculosis and Leprosy Program (NTLP)
- If 'No' to all questions: stop TB investigations and repeat screening at the subsequent visit (every month)

Action taken	Date	Result
Sputum smear		
Chest x - ray		
Appointment for next visit		
Refer for clinical assessment		
Started broad spectrum antibiotics		
Started anti – TB treatment		

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.

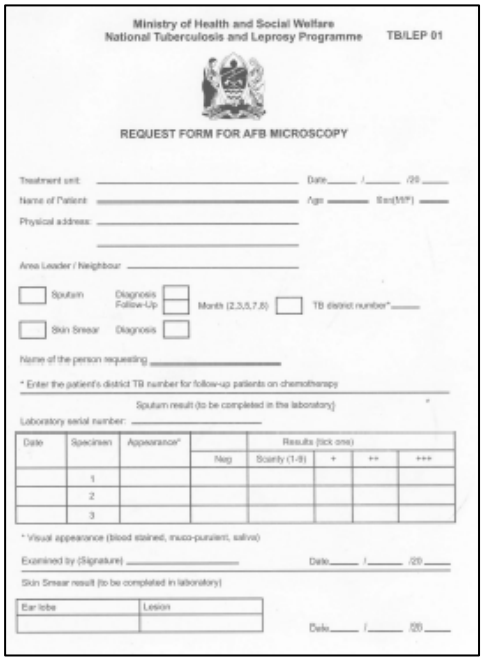
If the PLHIV does not report any sign or symptom listed in the TB questionnaire, he/she has to be re-assessed at the next follow up visit using the TB screening questionnaire.

►*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*



Ministry of Health and Social Welfare
National Tuberculosis and Leprosy Programme TB/LEP 01

REQUEST FORM FOR AFB MICROSCOPY

Treatment unit: _____ Date____ /____ /20 ____

Name of Patient: _____ Age ____ Sex(M/F) ____

Physical address: _____

_____

Area Leader / Neighbour: _____

☐ Sputum Diagnosis ☐ Follow-Up ☐ Month (2,3,5,7,8) ☐ TB district number* _____

☐ Skin Smear Diagnosis ☐

Name of the person requesting _____

* Enter the patient's district TB number for follow-up patients on chemotherapy

Sputum result (to be completed in the laboratory)

Laboratory serial number: _____

Date	Specimen	Appearance*		Results (tick one)			
			Neg	Scanty (1-9)	+	++	+++
	1						
	2						
	3						

* Visual appearance (blood stained, muco-purulent, saliva)

Examined by (Signature) _____ Date____ /____ /20 ____

Skin Smear result (to be completed in laboratory)

Ear lobe	Lesion

Date____ /____ /20 ____

- *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: ……client code Number……Tel.No. ……
Sex: ……Age: ……. Religion: ……..
Number of spouses: ……pregnant? Y/N/NA ……... Occupation: ……
Reason for referral: ……
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: ……Tel. Number: ……
Client Code Number: …… Sex: ……Age: ……
Service Offered: ……
Date Service was offered: ……

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

The following is a generic referral form to be used by CTC to transfer/refer the PLHIV to another CTC unit.

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF HEALTH AND SOCIAL WELFARE

NATIONAL HIV CARE AND TREATMENT

PATIENT REFERRAL / TRANSFER FORM

Nº 000172

Date: .....

Referral from: Facility name ..... Facility code.....

Referral to: Facility name .....

Name: First ..... Middle ..... Last .....

Date of birth: ...../...../..... Current age: ..... Sex: ☐ M ☐ F

Reason for referral / transfer: .....

ART start date: ...../...../..... Unique CTC ID#: .....

At start of ART:

Clinical stage ..... Weight ..... Function ..... CD4 .....

Current status - Date ...../...../.....

Clinical stage ..... Weight ..... Function ..... CD4 .....

Original first line regimen: .....

1st substitution: ..... date ...../...../ Why .....

2nd substitution: ..... date ...../...../ Why .....

Second line regimen: ..... date ...../...../ Why .....

Currently on TB treatment? ☐ Yes ☐ No..... If Yes, Date started: .....

Other relevant meds (Including INH, CTX, DIFLUCAN): .....

Drug allergies: .....

Currently pregnant? Yes ☐ No ☐ If Yes, EDD: .....

Other relevant clinical notes: .....

.....

Name, signature and stamp .....

FEEDBACK SECTION

Services Provided: To be filled out by the organization providing the requested service

Date:

Patient Name:	**Date of Birth/Age:**

Services Provided:

☐ Services provided: _____

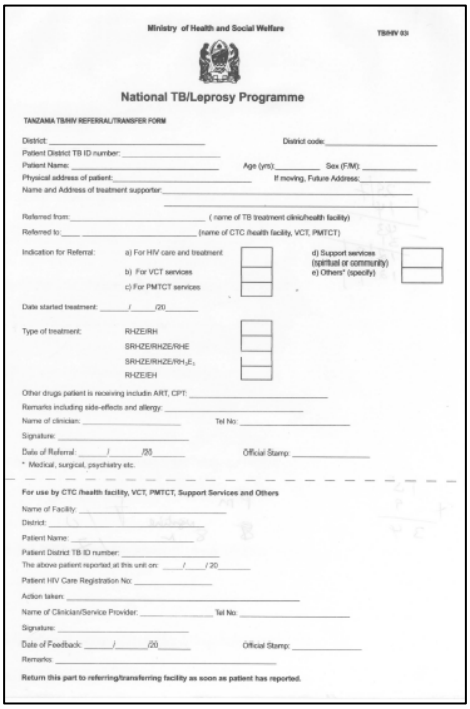
☐ Services completed as requested _____ Yes _____ No

☐ Follow-up needed: services: _____ Date for follow-up: _____

Additional Comments:

Name of Organization/Health Facility:	**Contact Person/referral focal person:** **Name:** _____ **Designation:** _____ **Mobile Tel No.** _____

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.



Ministry of Health and Social Welfare

TB/HIV 03

National TB/Leprosy Programme

TANZANIA TB/HIV REFERRAL/TRANSFER FORM

District: _____ District code: _____

Patient District TB ID number: _____

Patient Name: _____ Age (yrs): _____ Sex (F/M): _____

Physical address of patient: _____ If moving, Future Address: _____

Name and Address of treatment supporter: _____

Referred from: _____ (name of TB treatment clinic/health facility)

Referred to: _____ (name of CTC /health facility, VCT, PMTCT)

Indication for Referral:
- a) For HIV care and treatment ☐
- b) For VCT services ☐
- c) For PMTCT services ☐
- d) Support services (spiritual or community) ☐
- e) Others* (specify) ☐

Date started treatment: _____/_____/20_____

Type of treatment:
- RHZE/RH ☐
- SRHZE/RHZE/RHE ☐
- SRHZE/RHZE/RH$_3$E$_3$ ☐
- RHZE/EH ☐

Other drugs patient is receiving includin ART, CPT: _____

Remarks including side-effects and allergy: _____

Name of clinician: _____ Tel No: _____

Signature: _____

Date of Referral: _____/_____/20_____ Official Stamp: _____

* Medical, surgical, psychiatry etc.

For use by CTC /health facility, VCT, PMTCT, Support Services and Others

Name of Facility: _____

District: _____

Patient Name: _____

Patient District TB ID number: _____

The above patient reported at this unit on: ____/____/ 20_____

Patient HIV Care Registration No: _____

Action taken: _____

Name of Clinician/Service Provider: _____ Tel No: _____

Signature: _____

Date of Feedback: _____/_____/20_____ Official Stamp: _____

Remarks: _____

Return this part to referring/transferring facility as soon as patient has reported.

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.

	Adverse events	Management
Mild	- Tingling/ burning sensation - Joint pain - Mild skin rash - Peripheral neuropathy - Abdominal pain	Continue with INH, reassurance and reassessment
Severe	- Hepatitis/ jaundice - Severe skin rash with peeling skin - Disabling peripheral neuropathy - Convulsions	STOP INH and refer for further management

►*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

Differential Diagnosis	In favour
Common cold/bronchitis	• Short history • Normal CXR • No difficult breathing • No or mild fever
Pneumonia	• Short history • Fever • Responds to antibiotics • Unilateral effusion

Tuberculosis	• Chronic cough • Fever • Weight loss • Haemoptysis • Unilateral Effusion • Night sweats • Exposure to someone with TB • Blood stained sputum
Lung abscess	• Cough with large amounts of purulent sputum • Abscess with fluid level on CXR • Ruptured amebic liver abscess
Bronchiectasis	• Cough with large amounts of purulent sputum • Responds to antibiotics
Pneumocystis pneumonia	• Dry cough and dyspnoea • Fever • Nasal flaring • Marked tachypnoea dyspnoea • Spontaneous Pneumothorax • CXR with bilateral diffuse interstitial shadowing
Histoplasmosis	• Marked fever and weight loss • Mild or no respiratory symptom • CXR with bilateral diffuse interstitial shadowing • Enlarged liver and spleen

	• Enlarged lymph nodes • Insidious onset
Asthma	• Intermittent symptoms, generalized wheezing • Nocturnal symptoms
Heart Failure	• Tachypnoea, • Paroxysmal nocturnal dyspnoea • Haemoptysis • Hepatic congestion, • Peripheral edema, • Bilateral pulmonary effusion • Palpitations and/or elevated Jugular venous pressure (JVP)
Bronchial carcinoma	• Risk factors (smoking, older age, previous mine work)
Chronic obstructive	• No fever Risk factor (smoking) • Chronic symptoms generalized pulmonary disease • wheezing, dyspnoea • Right heart failure • Intermittant onset • History of smoke exposure • Older age vs young age (asthma)
Pneumothorax	• Sudden onset • Hyperresonance on percussion on one side • Diminished or absent breathing on

	one side • Subcutaneous emphysema
Acute allergic condition (anaphylaxis)	• Very acute onset • Known allergy • Skin rash • Angioedema
Pleural effusion	• Dull to percussion • Reduced breath sounds • Pleural rub • Chest x-ray shows fluid

6.2 Chest pain

Pneumonia	• Cough with fast breathing • Fever • Coarse crackles on auscultation • Productive cough • Acute onset • Pleuritic chest pain • Focal lung exam
Pneumothorax	• Acute onset • Hyper-resonance on physical exam • Severe shortness of breath • Pleural rub • Tracheal deviation (if severe)

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

Musculoskeletal	• Tenderness on palpation • Radiological findings • History of Trauma

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

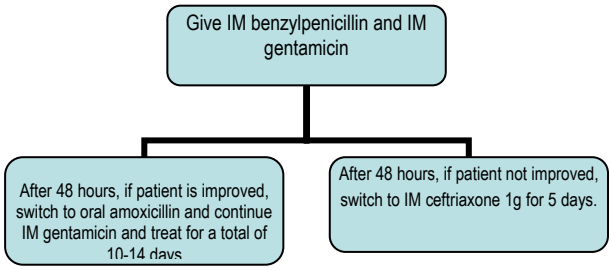
Additional signs:
- Retractions or labored breathing
- On auscultation, signs include decreased breath sounds (sign of consolidation), crackles, bronchial breath sounds, or a pleural rub.

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). If

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

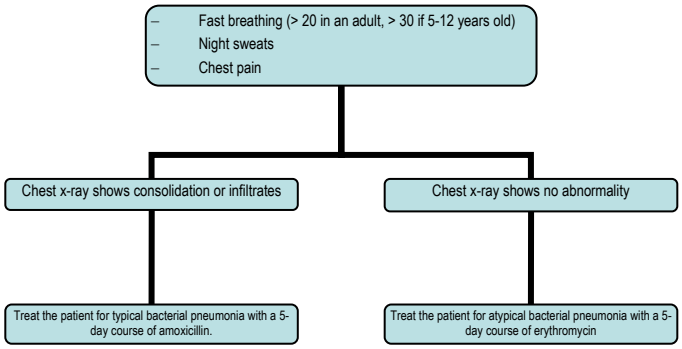
If one of the following conditions applies:

- 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:



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

	History and physical examination	CXR	Fluid	Laboratory analysis of pleural fluid
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)	Unilatl	▪ 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

	malignancy in other organ systems (KS, lymphoma)			
Heart/renal failure	▪ Cough, orthopnea, peripheral oedema	Bilat	▪ Clear and straw coloured ▪ Doesn't clot	▪ Protein < 3 g/L (transudate)

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

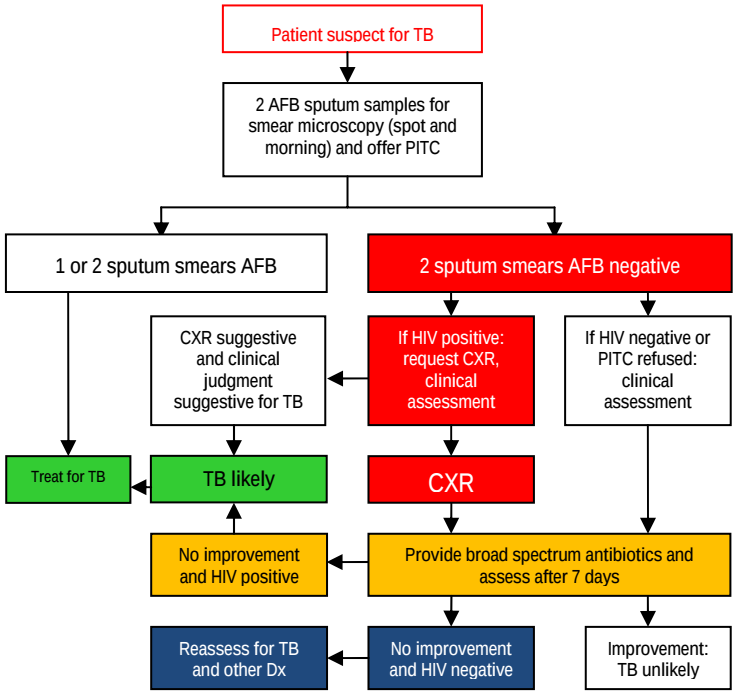
Prevention and follow up

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.



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

Pulmonary TB	Stage of HIV-infection	
	HIV clinical stage (1-2) CD4 > 200	HIV clinical stage (3-4) CD4 <200
Clinical picture	▪ Cough ≥ 2 weeks ▪ Productive sputum	▪ Dry cough, not productive
CXR appearance	▪ Upper lobe infiltrates ▪ Cavitation ▪ Nodular or patchy shadows	▪ Lower lobe infiltrates, no cavitation ▪ Often mediastinal lymphadenopathy and/or pleural effusion ▪ Sometimes miliary or interstitial pneumonia
Sputum smear	▪ Often positive (>80%)	▪ Often negative (< 50%)
Pneumocystis Pneumonia		
Clinical picture	Unlikely	▪ Fever ▪ Dry cough ▪ Dyspnoea
CXR appearance		▪ Bilateral diffuse infiltrates ▪ May be normal ▪ Spontaneous pneumothorax
Laboratory		Not useful

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.

CD4 > 350	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)*
CD4 200 – 350	Treat TB first for two month before starting ART
CD4 < 200 or CD4 < 15% or WHO HIV stage 4	Begin ART as early as 2 weeks after TB treatment initiation

Anti-TB regimens in PLHIV are the same as in HIV-negative patients.

Disease site	Laboratory results	Type of patient		Recommended treatment category
PTB	Sputum smear-positive	New		CAT I
		Previously treated	Relapse	CAT II
			Treatment after failure	CAT II
			Treatment after default	Usually CAT II
			Chronic or MDR-TB*	CAT IV
	Sputum smear-negative			CAT I or III [c]
EPTB				CAT I or III [c]

** 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

Choose the appropriate TB-ART co-treatment regimen for pregnant women	
Scenario	Comments
If there is indication to start ART within the first trimester	Use NVP-based regimen
If it is possible to defer ART until the end of first trimester	EFV can be used in the second and third trimester

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.

Signs or symptoms	Management
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

Deafness Dizziness Jaundice Vomiting repeatedly Difficulty with vision	Stop TB and ART drugs
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 Lymph adenopathy	– This could be immune reconstitution syndrome: in that case, refer to the expert

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

Drug	Likelihood of causing a reaction	Challenge doses		
		Day 1	Day 2	Day 3
Isoniazid	Least likely	50 mg	300 mg	300 mg
Rifampicin		75 mg	300 mg	Full dose
Pyrazinamide		250 mg	1 g	Full dose
Ethambutol		100 mg	500 mg	Full dose
Streptomycin		125 mg	500 mg	Full dose

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 can not 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 referral 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	0	1	2	3	4	Score
Duration of illness	<2 weeks	2-4 weeks		More than 4 weeks		
Failure to thrive or weight loss	Weight gain		No weight gain		Weight loss	
TB contact	None	Reported, not proven		Proven EPTB, Smear+	Proven Smear +	
Malnutrition				Not improved after 4 weeks		
Chronic infant disease				Not improved after 4 weeks		
Frequency of illness		Recurrent		No response to antibiotics		
Chest x-ray				TB suggestive (infiltration, cavity or hilar lymph nodes)		
Lymph nodes				Cervical, sub-mandibular		
Swelling of bone or joint				Suggestive feature on X-ray		
Ascites			No abdominal mass	With abdominal mass		
Meningitis				Chronic C.N.S. signs		
Angle deformity of spine					X-ray feature	
TOTAL SCORE						

The child should be assessed for any of the features above and scored according to the findings. A final score ≥ 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*.

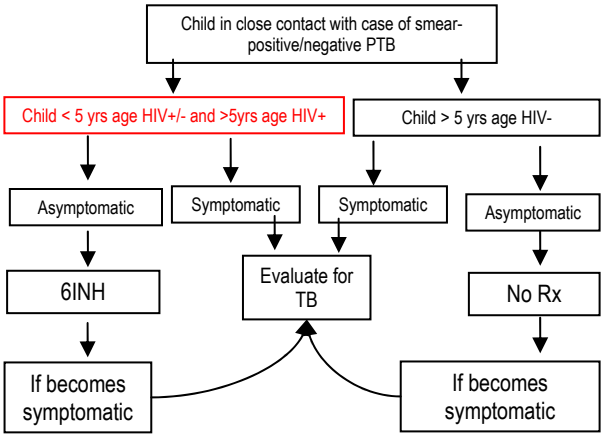
The diagnosis should be made if the child has *2 or more* of the following:

- 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:



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 ≥ 2 weeks if the HCW is HIV negative; cough ≥ 2 weeks or fever ≥ 2 weeks, or excessive night sweat ≥ 2 weeks or haemoptysis or weight loss ≥ 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.

MANAGEMENT OF TB/HIV CO-INFECTED PATIENTS - MANUAL FOR THE HEALTH CARE WORKERS AT TB CLINICS AND HIV CARE & TREATMENT CENTERS

NATIONAL TUBERCULOSIS AND LEPROSY PROGRAMME
NATIONAL AIDS CONTROL PROGRAMME
MINISTRY OF HEALTH AND SOCIAL WELFARE

International Center for AIDS Care and treatment Programs, Mailman School of Public Health-Columbia University-Tanzania

Centers for Disease Control and prevention - Tanzania

PharmAccess Foundation – Tanzania

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Version for field testing