GUIDELINES FOR PREVENTION AND TREATMENT OF CHILDHOOD TUBERCULOSIS IN MALDIVES

Second Edition

2015

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Abbreviations

AFB	Acid-Fast Bacilli
AP	anterior posterior
ART	Anti-retroviral treatment
Cap	Capsule
CBC	Complete Blood Count
CMI	cell mediated immunity
CNS	Central nervous system
CRF	chronic Renal Failure
CXR	Chest x-ray
DM	Diabetes Mellitus
DOTs	Directly observed treatment strategy
DT	Dispersible tablet
e/o	Evidence of
ESR	Erythrocyte sedimentation ratio
f/u	Follow up
FNAC	Fine needle aspiration cytology
FTT	Failure to thrive
GA	Gastric aspirate
h/o	History of
HIV	Human Immunodeficiency Virus
I&D	Incision and drainage
IPT	Isoniazid Preventive therapy
IRIS	immune reconstitution inflammatory syndrome
LFT	Liver function test
LNs	lymph nodes
LTBI	Latent tuberculosis infection
MDR-TB	Multidrug-resistant tuberculosis
MTB	Mycobacterium Tuberculosis
NAATs	Nucleic Acid Amplification Tests
NB	Newborn
NTM	non tubercullosis meningitis
PCR	Polymerase chain reaction
PPD	Purified protein derivative
PTB	pulmonary tuberculosis
Rx	Treatment
s/o	sign of
STAC	SAARC Tuberculosis and HIV/AIDS centre
Susp	Suspension
Tab	Tablet
TB	Tuberculosis
TST	Tuberculin Skin Test
TU	Tuberculin unit
WHO	World health organization

1. INTRODUCTION

1.1 EPIDEMIOLOGY

Tuberculosis (TB) is an infectious disease caused by five closely related species of mycobacteria in which Mycobacterium Tuberculosis (MTB) is the most important cause of tuberculosis disease in human. MTB is an airborne infectious disease that is preventable and curable. It is among the top 10 causes of death among children worldwide. Children can present with TB at any age, but the most common age is between 1 and 4 years. According WHO, at least half a million children become ill with TB each year.

TB, once regarded as one of the most fatal diseases in the history of Maldives, has still not been brought totally under control. The TB prevalence rate of 35 per 1000 population in 1974 declined to 0.26 in 2004[1]. Childhood TB (under 5 years) has been almost zero until recent years due to the high BCG coverage of infants. However due to the increased exposure rates of children to adults with active TB disease both locally and to the high TB prevalent countries in the region, childhood TB is on the rise.

Accurate diagnosis of MTB in children has long been difficult and current technologically advanced diagnostic tools available for adults fail to address the problems experienced in diagnosing TB in children. Similarly, trials of new drugs and development of pediatric formulations of standard first and second line drugs are lagging behind.

1.2 TUBERCULOSIS IN CHILDREN

TB is spread from person to person through the air by droplet nuclei with particles of 1 to 5μ m in diameter that contain Mycobacterium tuberculosis. Droplet nuclei are produced when persons with pulmonary or laryngeal tuberculosis cough, sneeze, speak, or sing. They also may be produced by aerosol treatments, sputum induction and during bronchoscopy. However, only a small percentage of children who inhale the TB organism actually develop active disease.

FOUR FACTORS DETERMINE THE LIKELIHOOD OF TRANSMISSION OF MTB, FOLLOWING AN EXPOSURE

1. Number of organisms being expelled into the air,
2. Concentration of organisms in the air,
3. Length of time an exposed person breathes the contaminated air and

4. Immune status of the exposed individual.

After inhalation, the droplet nucleus is carried down the bronchial tree and implants in a respiratory bronchiole or alveolus. Before the development of cellular immunity, tubercle bacilli spread via the lymphatics to the hilar lymph nodes and then through the bloodstream to more distant sites.

The tubercle bacillus grows slowly, dividing approximately every 25 to 32 h within the macrophage. MTB has no known endotoxins or exotoxins; therefore, there is no immediate host response to infection. The organisms grow for 2 to 12 wk, until they reach 10^3 to 10^4 in number, to elicit a cellular immune response.

Latent tuberculosis infection (LTBI) occurs after the inhalations of MTB, which is characterized by a reactive Tuberculin Skin Test (TST) and absence of clinical and radiological manifestation of the Tuberculosis Disease. Infants and children with LTBI but not active tuberculosis disease are not infectious and thus cannot transmit the organism. But if left untreated LTBI have up to a 40% likelihood of developing in to active BT disease.

1.3 KEY FACTORS THAT PUT CHILDREN AT RISK OF ACQUIRING TB

The risk of developing active TB disease in children following infection with M. tuberculosis is mainly determined:

1. Close contact with a known case of infectious TB (parents, siblings, close relative, caregivers, neighbors or teacher)
2. Immunosuppressive conditions (such as severe malnutrition, following Measles in the past 3 months, HIV/AIDS, receiving immunosuppressive therapy.
3. The time lapsed since the last exposure. Majority of the children who develop TB disease do so usually within the first year.
4. Age of the child. (See table1)(ref)

Table 1: Age specific risk to progress to active TB disease, following primary infection with MTB in immunocompetent children (Adopted from national guidelines for management of TB in children in Bangladesh, May 2013)

Age at primary infection(year)	Risk of progressing to active TB disease
<1	No disease, 50% Pulmonary TB, 30-40% Disseminated TB or TB meningitis 10-20%
1-2	No disease, 75-80% Pulmonary TB, 10-20% Disseminated TB or TB meningitis 2-5%
2-5	No disease, 95% Pulmonary TB, 5% Disseminated TB or TB meningitis <0.5%
5-10	No disease, 98% Pulmonary TB, 2% Disseminated TB or TB meningitis <0.5%
>10	No disease 80-90% Pulmonary disease 10-20% Disseminated TB or TB meningitis <0.5%

2. CASE DEFINITIONS OF TB IN CHILDREN

The complete case definition of TB is determined by

1. Confirmation of TB,
2. Site of TB
3. Result of any bacteriological results
4. Severity of TB disease
5. History of previous ATT

All children with TB should be registered with NTP as pulmonary (smear positive or smear negative) or extra pulmonary TB and as either new case or previously treated cases.

WHO categories children as suspected, probable and confirmed cases of TB, based on exposure, poorly defined symptoms and CXR interpretation and bacteriology.

SUSPECTED TUBERCULOSIS

1. An ill child with a history of contact with a confirmed case of pulmonary tuberculosis
2. Any child
    - Not regaining normal health after measles or whooping cough
    - With loss of weight, cough and wheeze not responding to antibiotic therapy for respiratory disease
    - With painless swellings in a group of superficial nodes

PROBABLE TUBERCULOSIS

A suspect case and any of the following

- Positive (>10 mm) induration on TST
- Suggestive appearance on chest radiograph
- Suggestive histological appearance of biopsy material
- Favorable response to specific anti tuberculous therapy

CONFIRMED TUBERCULOSIS

Detection by microscopy or culture of *Mycobacterium tuberculosis* bacilli from secretions or tissues

CONTACT WITH AN INDEX CASE

Defined as any child who lives in a household with an adult taking ATT or has taken such treatment in the past 2yrs

CRITERIA FOR DIAGNOSING SPUTUM SMEAR POSITIVE PTB

1. Two or more initial sputum smear examinations positive for AFB **OR**
2. One sputum smear positive for AFB and CXR findings consistent with active PTB **OR**
3. One sputum smear positive for AFB and plus sputum culture positive for M. tuberculosis

CRITERIA FOR DIAGNOSING SPUTUM SMEAR NEGATIVE PTB

1. At least three sputum smear negative for AFB **AND**
2. Presence of diagnostic feature strongly suggestive of PTB **AND**
3. Decision by a clinician to treat with course of ATT

Note:

Children who have both pulmonary and extra pulmonary TB should be classified under case definition of Pulmonary TB

DRUG RESISTANT TB

Drug-resistant TB is a laboratory diagnosis and should be suspected in any child with the following features:

1. **Feature in the index case suggestive of drug resistant TB**

    - Contact with a known case of drug resistant TB
    - Previously treated for TB
    - Remains sputum smear positive after 3 months of treatment
    - History of treatment interruption

2. **Features in the child suggestive of drug resistant TB**

    - Contact with a known case of drug resistant TB
    - Not responding to standard ATT regimen
    - Recurrence of TB after adherence to treatment is assured

3. DIAGNOSIS OF TB IN CHILDREN

Diagnosis of childhood tuberculosis requires careful and thorough assessment of all the evidence derived form careful history, clinical examination and relevant investigations. Pulmonary TB is the most common form of TB is children. However, the majority of children with tuberculosis infection develop no signs or symptoms at any time and there are no specific features that can confirm the presence of TB in children.

WHO SHOULD BE EVALUATED FOR TB

- Any child with history of exposure to an adult with Pulmonary TB or with evidence of documented TB infection (TST positive)
- Any child with pneumonia, pleural effusion, a cavitory or mass lesion in the lungs that does not improve with a course of standard antibiotics
- Any child with fever of unknown origin, failure to thrive, significant weightless, severe malnutrition
- Any child with a known immunosuppressive condition such as Measles in the past 3 months; whooping cough, HIV/AIDS, under immunosuppressive medications
- Unexplained lymphadenopathy
- Children with Diabetes mellitus (new recommendation from STAC)

3.1 CHALLENGES IN THE DIAGNOSIS OF TB IN CHILDREN

- Symptoms are often non – specific
- Disease is paucibacillary and microbiological diagnosis is often not possible
- Difficult to obtain sputum
- TST is often negative in malnourished children and disseminated TB
- X-rays are often non specific

RECOMMENDED APPROACH FOR DIAGNOSING TB IN CHILDREN

1. History (focusing on contact, symptoms /signs suggestive of TB)
2. Clinical examination (including serial weight)
3. Specific Diagnostic modalities
    - TST
    - Chest X-ray
    - Bacteriological confirmation
    - Investigation for relevant EPTB
    - Other tests
    - Screening
        - HIV, Diabetes mellitus (new recommendation from STAC

Although bacteriological confirmation of TB is not always feasible, it should be sought whenever possible by microscopy, culture or Xpert MTB/RIF of respiratory or non nonrespiratory samples as indicated by clinical presentation. A trial of treatment with antiTB medications is not recommended as a method of diagnosing TB in children.

3.2.SYMPTOM BASED DIAGNOSTIC APPROACH

Unlike adults, clinical Features of childhood TB are very vague and non-specific like poor appetite or poor growth. TB infection in children can progress to severe disease more rapidly in infants and young children.

Symptom criteria for Diagnosing Pulmonary TB

Persistent non remitting cough for >2 weeks, not responding to a course of antibiotic and /or bronchodilators

AND/OR

Persistent documented fever (of >38C/100F) for >2 weeks after common causes are excluded.

AND/OR

Documented weight loss of >20% or not gaining weight during the past 3 months (specially if not responding to de-worming, and food and micronutrient supplementation) OR severe malnutrition

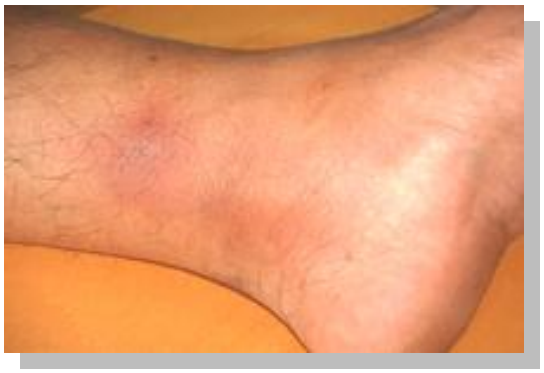
AND/OR

Fatigue and reduced playfulness

Symptoms and signs suggestive of extra pulmonary TB

Symptoms and signs	Extra pulmonary TB
Painless, enlarged, mattered LN (>2x2cm), not fixed to underlying tissues usually in neck, not responding to a course of antibiotic	TB lymphadenitis. (commonly cervical)
Cough shortness of breath	Pleural TB, Pericardial TB
Reduced playfulness, irritability, weight loss, headache, vomiting, drowsiness, altered sensorium	TB meningitis
Abdominal pain, altered bowel habits mass or ascites	Abdominal TB
Gibbus	Spinal TB
Chronic pain and swelling of joints usually single	TB arthritis

Uncommon signs indicative of recent TB infection

Phlyctenular conjunctivitis- raised patch at the junction of the sclera and cornea surrounded by a red area of conjunctivitis. 	**Erythema nodosum**- raised, tender, purple patches on the shin 

3.3-DIAGNOSTIC TESTS

BACTERIOLOGICAL CONFIRMATION

Every attempt should be made to confirm the diagnosis of TB in children, using whatever specimens and laboratory facilities are available, to demonstrate AFB. Commonly used methods are;

1. Smear microscopy
2. Culture
3. Gene Xpert MTB/RIF(Xpert MTB/RIF will be used as the initial test in all children suspected of having TB)

Bacteriological confirmation is particularly important for children with

- Suspected drug resistant TB
- Severe immunosuppression
- Uncertain diagnosis

Xpert MTB/RIF

Xpert MTB/RIF should be used rather than conventional microscopy and culture as the initial test in all children suspected of having TB, MDR TB or HIV-associated TB

Children suspected of having pulmonary TB but with a single Xpert MTB/Rif negative result should undergo further diagnostic testing and a child with high clinical suspicion for TB should be treated even if an Xpert MTB/Rif is negative

Xpert MTB/RIF would be used as a replacement test for usual practice for testing of specific non-respiratory specimens (lymphnodes and other tissues) from children suspected of having extra pulmonary TB. Suspected children with a single Xpert MTB/RIF-negative result should undergo further diagnostic testing, and those with high clinical suspicion for TB should be treated even if an Xpert MTB/RIF result is negative

Xpert MTB/RIF should be used in preference to conventional microscopy and culture as the initial diagnostic test in testing cerebrospinal fluid specimens from children suspected of having TB meningitis
For CSF specimens, Xpert MTB/RIF should be used over culture if the sample volume is low or additional specimens cannot be obtained, in order to reach quick diagnosis. If sufficient volume of material is available, concentration methods should be used to increase yield.

Pleural fluid is a suboptimal sample for the bacterial confirmation of pleural TB using any method. The preferred sample is a pleural biopsy.

The sensitivity of Xpert MTB/RIF in pleural fluid is very low. Nevertheless, any positive Xpert MTB/RIF result based on pleural fluid should be treated for pleural TB, while those with a negative Xpert MTB/RIF result should be followed by other tests.

SMEAR MICROCOPY

Common ways of obtaining samples for smear microscopy

- Expectoration
- Gastric aspiration
- Sputum induction
- FNAC

3.4 Sputum collection for bacteriology

Sputum should always be obtained in children presenting with a chronic cough however, pulmonary TB in young children is usually paucibacillary and the collection of adequate samples is difficult.

Recommended methods for sputum collection in children

Gastric aspiration	• Can be performed in young children who are unable to expectorate sputum. The child must fast for about 6 hours (at night) • The child must be in a sitting or semi-sitting position• Insert a nasogastric tube and check that it is correctly positioned • Suction to collect the gastric fluid, place this in the specimen bottle • Further washings with 15- 30 ml of sterile water maybe collected and added to the first sample. • On the laboratory request form indicate that the sample is a " gastric aspirate
Expectoration	• Sputum collection is possible in older children with extensive and cavitatory disease, particularly if the patient has a chronic cough. • The patient must first rinse their mouth • Then take a deep breath, hold for a second and exhale repeating this two or three times before coughing into the specimen bottle • Check the quantity and quality of the specimen and request the patient to cough up more if inadequate or collect another sample if not satisfactory. • On the lab request form indicate that the sample is expectorated sputum
Sputum induction	is encouraged in patients with difficulties in producing sputum • On the laboratory request form indicate that the sample is " induced sputum" . • The child should fast for at least 3 hours prior to induction • The child must be in a sitting position • The patient is pretreated with bronchodilators like salbutamol prior to induction, to reduce the risk of bronchospasm • Nebulise with 5ml of 3% hypertonic saline solution for 15 minutes or until the solution is finished. • Chest physiotherapy may be done to loosen up the secretion • Samples collected from the throat / nasopharynx using a nasopharyngeal suction. • For children who can cough up sputum, they can expectorate spontaneously
Bronchial washings / BAL	• On completing the laboratory request form indicate that the sample is BAL / Bronchial washings

CULTURE

Collection of specimen for culture is important in complicated cases or when there is concern of drug resistance TB. The probability of obtaining a positive TB culture increases when more than one sample is taken. Hence it' s recommended to take at least 2 samples for culture.

OTHER TESTS

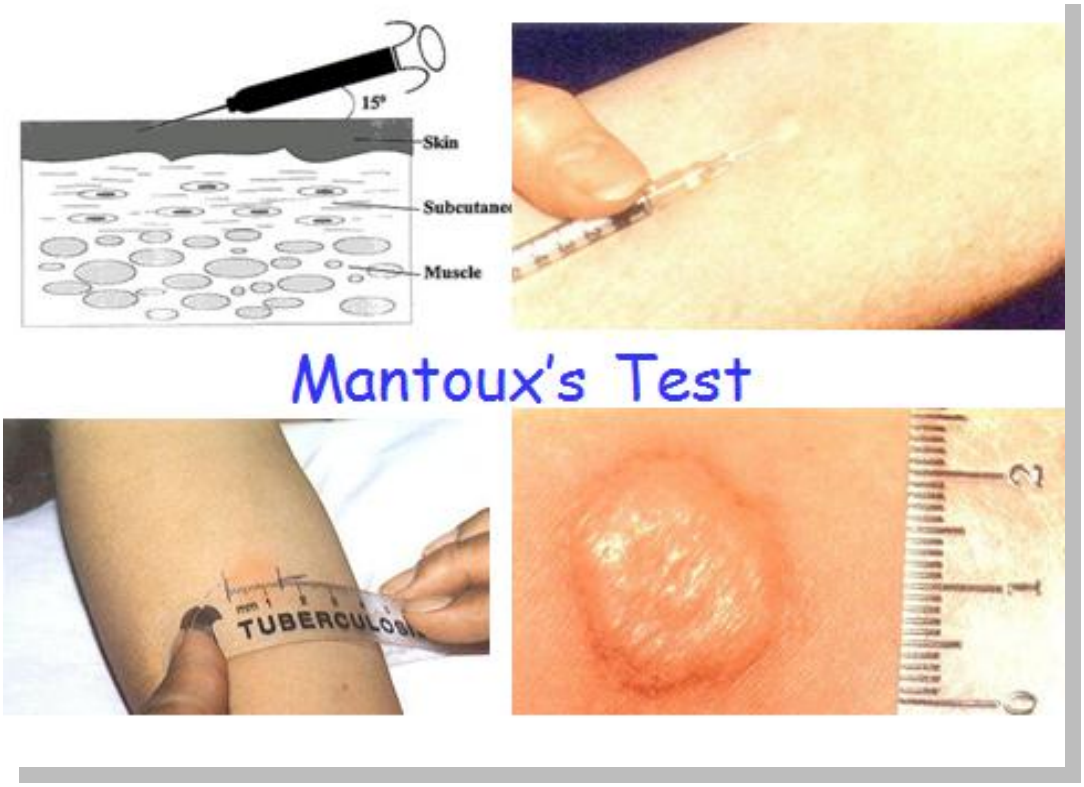
- Baseline CBC, platelet, liver enzymes, renal function before starting ATT
- ESR is a non specific test for inflammation and has no role in confirming or excluding TB
- Serology and PCR are not recommended for routine diagnosis of childhood TB
- Novel T-cell assays (IGRAs) provide essentially same information as TST

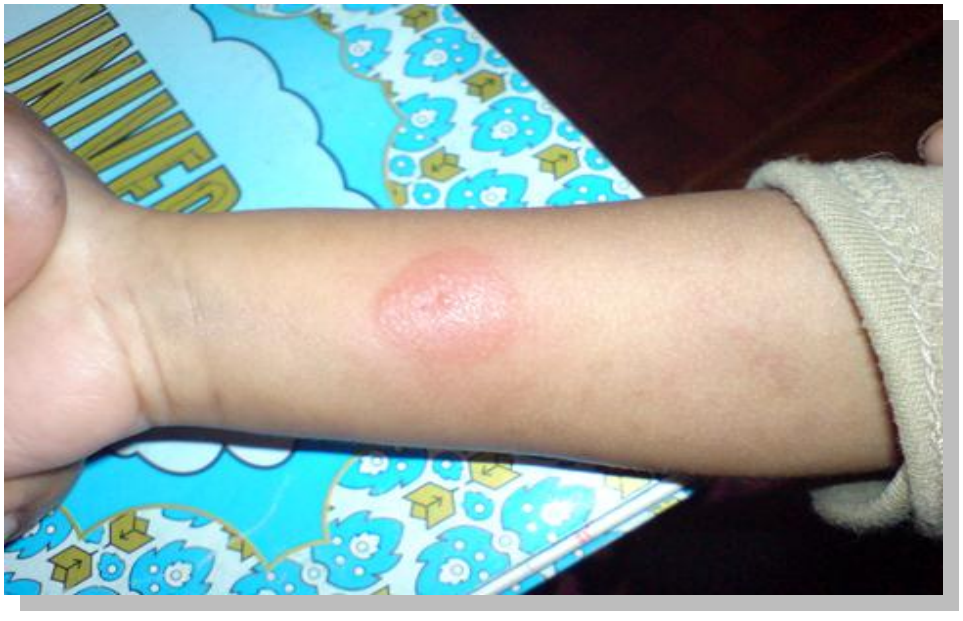
3.5 TUBERCULIN SKIN TEST (MANTOUX TEST)

The reaction to tuberculin is the classic example of a delayed hypersensitivity reaction. T-cells sensitized by prior infection are recruited to the skin site where they release lymphokines.

Procedure:

- 1ml of suitable dilution of PPD is injected intradermal on volar aspect of forearm.
- 5 TU of PPD-S or 2 TU PPD RT 23, read after 48-72 hours
- Record only induration
- It is not 100% specific or sensitive





Interferon gamma release assays should not replace TST for the diagnosis of latent TB infection or for the diagnostic work up of children suspected of TB disease

INTERPRETATION OF TST RESULT

There is no correlation between the size of induration and likelihood of current active TB disease but the **reaction size is correlated with the future risk of developing TB disease**

≥ 5MM IS POSITIVE IN

- HIV-positive person
- Persons with nodular / fibrotic changes on Chest X-ray consistent with old healed TB
- immunosuppressed patients.
- Patients on long term systemic corticosteroid therapy (> than six weeks) and those on a dose of prednisone ≥ 15 mg/day or equivalent.
- End stage renal disease

≥ 10MM IS POSITIVE IN

- Immigrants from high-prevalence countries
- Residents and employees of high-risk congregate settings (e.g., prisons, hospitals, homeless shelters, etc.)
- Infants, children, and adolescents exposed to adults in high-risk categories

≥ 15MM IS POSITIVE IN

- Persons with no known risk factors for TB. Reactions larger than 15 mm are unlikely to be due to previous BCG vaccination or exposure to environmental mycobacteria.

MANTOUX REVERSION

Reversion is defined as the change to a negative Mantoux result following a previous positive result. Generally this phenomenon is uncommon in healthy individuals, occurring in less than 10% of such people with a previously positive Mantoux.

FALSE NEGATIVE TUBERCULIN REACTIONS

1. Test done in incubation period (<3months) or before the hypersensitivity has developed
2. Severe malnutrition or other immune suppressive conditions
3. Measles within the last 3 months
4. Whooping cough
5. HIV infection

6. Corticosteroid therapy.
7. Overwhelming infection - e.g. TB meningitis, Miliary TB.
8. Wrong technique
9. Inactive tuberculin - Exposure to sunlight, high temp, storage for prolonged period after dilution

TST RECOMMENDATIONS IN CHILDREN

Children for whom immediate TST is recommended

1. Contact investigation
2. Children with radiographic or clinical findings suggesting TB disease
3. Children immigrating from endemic regions of the world
4. Children with travel histories to countries with endemic infection and substantial contact with indigenous people from such countries

Children who should have annual TST

1. Children infected with HIV
2. Incarcerated adolescents
3. Children at increased risk for progression of LTBI to TB disease
4. Children with medical conditions like DM, CRF, severe malnutrition and other immunodeficiencies

Situations where TST testing is not recommended

1. Past TST reactions ≥ 15 mm: repeating the test will provide no new diagnostic information and will create more anxiety

2. Previous TB disease: no useful diagnostic information will be gained and significant discomfort is likely

3.6 CHEST X-RAY

A good quality chest radiograph is useful in the diagnosis of TB in children. In the majority of cases, children with pulmonary TB have CXR changes suggestive of TB. Always get reporting from radiologist.

Most common X- ray changes in TB in children

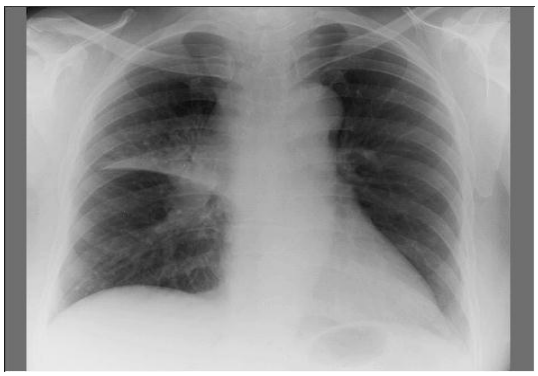
1. Increased density in the hilar region and /or broad mediastinum due to enlarged hilar lymph nodes.
2. Persistent opacity in the lung field
3.

Less common X- ray changes in TB in children

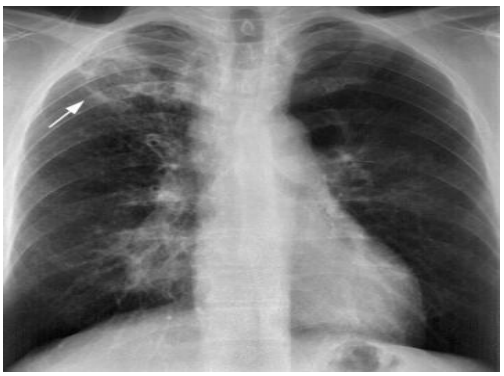
1. Compression of airway (segmental or lobar hyperinflation, due to partial occlusion and collapse of a segmental or lobe in complete occlusion)
2. Military mottling
3. Pleural effusion

Persistent calcification, which does not improve after a course of antibiotics, should be investigated for TB.

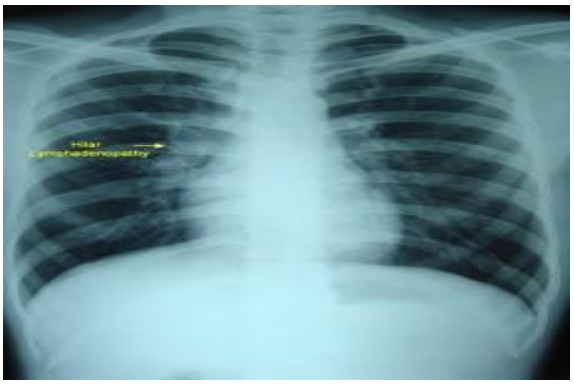
X-Ray Pictures suggestive of Pulmonary TB



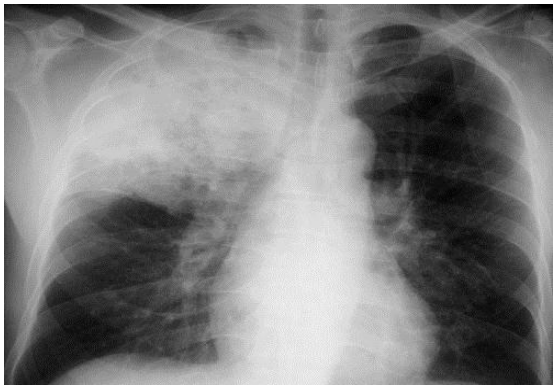
perihilar adenopathy with surrounding inflammaton



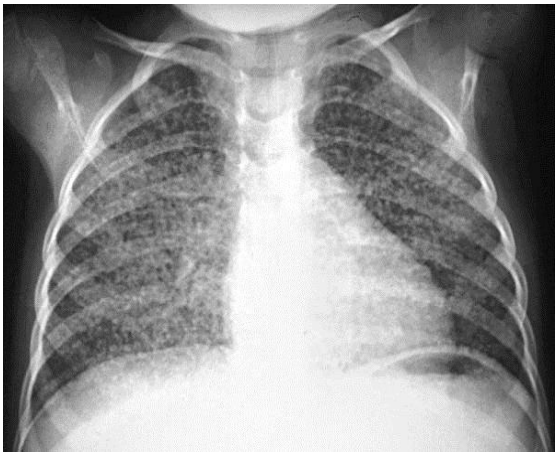
prominent paratracheal LN+ cavitary opacity RT upperlobe

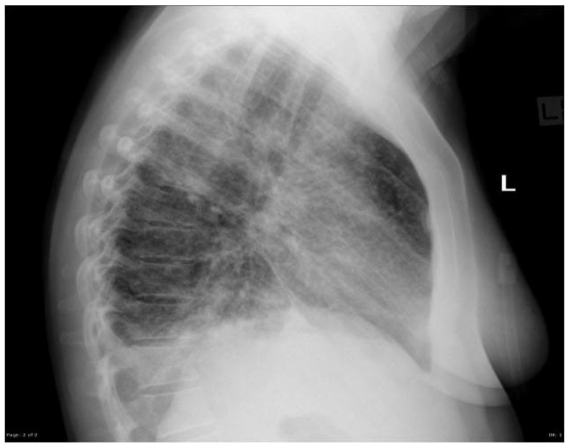


Hilar lymhadenopathy

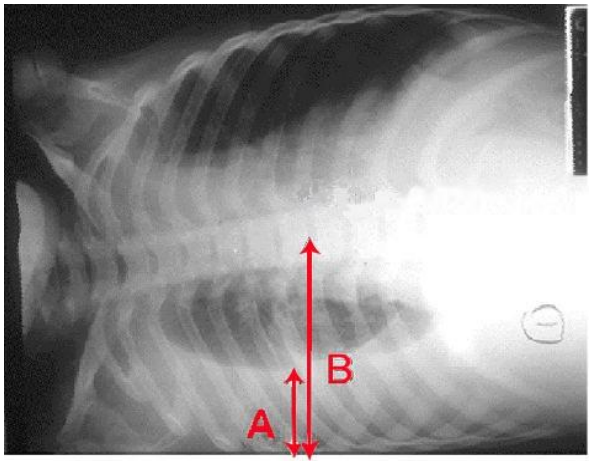


opacity (consolidation) right upper lobe

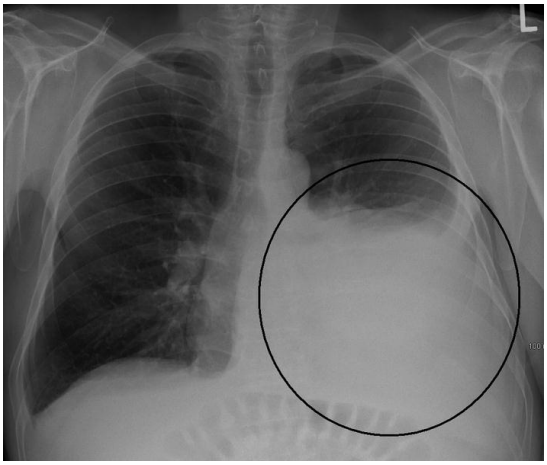




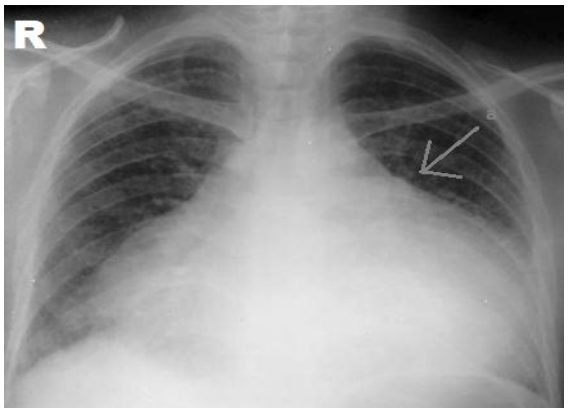
Miliary Tuberculosis



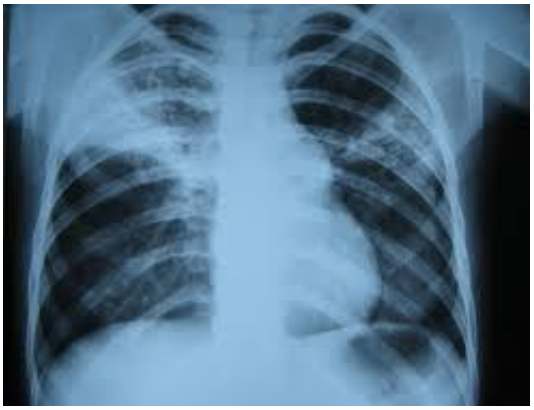
Pleural effusion (Arrow A – fluid layer in the right



pleural effusion



Pericardial effusion



pulmonary TB with parynchymal disease

4. EVALUATION FOR SUSPECTED EXTRA PULMONARY TB

Most of the suspected extra pulmonary TB cases can be confirmed by histopathology or other special investigations. All forms may require an initial TST and Chest X-ray

Approach for common forms of extra pulmonary TB in children

Anatomical site	Investigation/procedure
Peripheral Lymphnodes	FNAC or biopsy
Military (Disseminated) TB	CXR, and LP (to exclude TBM)
TB Meningitis	LP, CT scan Brain
Tuberculoma of Brain	CT scan/MRI Brain
Pleural effusion	CXR, Pleural tapping, Pleural biopsy
Abdominal TB	USG abdomen, Ascitic tapping
TB arthritis or Bone	X ray, Joint fluid study, Bone/synovial biopsy
Pericardial TB	CXR, Echo, Pericardial tapping , biopsy

4.1-TB lymphadenitis

Tuberculous lymphadenitis usually occurs in the neck (cervical neck glands) but may involve axillary and inguinal lymph nodes. The enlarged nodes are usually painless and have developed over time (two weeks or more). They may be firm and discreet nodes at the beginning and become fluctuant and matted together. Later an abscess may form which may break through the overlying skin to form a chronic sinus.

Consider TB lymphadenitis in a child who has;

- Painless enlargement of cervical nodes
- No lesion on the head that could cause the lymph gland enlargement
- No response to antibiotics.

The certainty of the diagnosis can be improved by a positive Mantoux skin test, chest x-ray and fine needle aspirate or biospy.

4.2-TB meningitis

TB meningitis is a very serious form of TB in children and characterised by gradual onset of symptoms. Complications include obstruction of cerebrospinal fluid flow, hydrocephalus, inappropriate anti-diuretic hormone secretion, hemi- or quadriplegia, convulsions, deafness, blindness and mental retardation.

Typical history and symptoms include:

- Contact with a person who has infectious TB.
- Lack of interest in playing or change in behaviour
- Headache, especially if accompanied by early morning vomiting.
- Irritability,
- Drowsiness, convulsions.
- Weight loss.

Physical signs include:

- Neck pain and resistance to neck flexion due to meningeal irritation (Kernig' s sign).
- Cranial nerve palsies.
- Altered level of consciousness.

Investigations:

- Lumbar puncture

- CSF has raised protein, low glucose, low chloride, predominantly lymphocytes; the gram stain is negative and acid fast bacilli are seldom found.

- Gene Xpert for MTB detection and Rifampicin susceptibility testing
- Mantoux skin test – The Mantoux can however be negative
- Chest x-ray- may be normal in children with TBM

Always consider TB meningitis in children diagnosed with meningitis and not responding to treatment. These children should be urgently referred to a hospital for management.

4.3-Miliary TB

This is a complication of primary TB in young children. It results from widespread blood borne dissemination of TB bacilli. Patients may present with systemic features such as low-grade fever, weight loss, fatigue and malaise. The patient may have a history of cough and respiratory distress.

Physical signs include:

- Lymphadenopathy,
- Hepatosplenomegaly,
- Fever.
- Tachypnea, cyanosis, and respiratory distress.
- Other signs - papular, lesions on the skin or choroidal tubercles in the retina.

Investigations

- Chest x-rays

– diffuse, uniformly distributed, small military shadows, " millet seed" appearance

- Full blood count – pancytopaenia
- Liver Function Test – abnormal
- Biopsy– tubercles on histology
- Culture– Isolation of MTB in CSF, bone marrow, sputum

4.4-Pleural effusion

Inflammatory tuberculous effusions may occur in any serous cavity of the body i.e. pleural, pericardial, peritoneal. They are common in older children and adolescents. Patients with pleural effusions may present with chest pains, breathlessness

Physical signs include;

- Decreased chest movement
- Stony dullness

Investigations

- Chest x-rays

- Tracheal/ mediastinal shift away from side of effusion

- Unilateral or bilateral uniform, white opacity with a concave upper border

• Pleural aspirate

– exudate, straw colored, high protein, high WCC, raised Adenosine Deaminase (ADA)

• Pleural biopsy

– for Gene Xpert testing

TB and HIV

In countries with low HIV prevalence, HIV counseling and testing in indicated for TB patients with symptoms and / or signs of HIV related condition or with a history of high risk of HIV exposure.

TB and diabetes Mellitus

People with diabetes are at higher risk of developing tuberculosis (TB) than those without diabetes. The link between tuberculosis and diabetes requires interventions that address both diseases. For example, screening for tuberculosis in people with diabetes and screening for diabetes in people with tuberculosis could offer opportunities to increase detection and prevent diabetes or tuberculosis-related complications.

ESTABLISHING DIAGNOSIS OF TB IN CHILDREN

Even though confirming TB in children is challenging, a fairly accurate diagnosis of TB can be established.

Diagnostic Approach to TB in children
The presence of 3 or more of the following features strongly suggests a diagnosis of TB 1. Symptom criteria suggestive of TB 2. A history of recent close contact (within the past 12 months) 3. Physical examination highly suggestive of TB 4. A positive TST 5. Chest X ray suggestive of TB

5. TREATMENT OF TUBERCULOSIS IN CHILDREN

STOP TB STRATEGY

The Stop TB Strategy of WHO is aimed at reducing the worldwide burden of disease and thus in protecting children from LTBI and disease. Children usually have paucibacillary pulmonary disease and cavitation is rare. But children develop extra pulmonart forms of TB more often than adults. And severe and disseminated TB (TB meningitis, military TB) occurs specially in children under 3 years.

The management of children with TB should be in line with the Stop TB Strategy, taking into consideration the particular epidemiology and clinical presentation of TB in children. Treatment outcomes in children are generally good.

OBJECTIVES OF TREATMENT OF TB IN CHILDREN

1. Cure individual patients
2. Prevent death from active TB or its late effects
3. Prevent relapse of TB
4. Reduce transmission
5. Prevent development of drug resistant TB

5.1 PHARMACOKINETICS OF FIRST LINE ATT DRUGS

Rapid reduction of bacilli load is important to limit disease progression, terminate transmission and prevent drug resistance. This is achieved by bactericidal drugs that kill active bacilli and bacteriostatic drugs that kill dormant bacilli. This approach justifies the use multiple drugs for prolonged duration, yet with minimal toxicity

Drug	Pharmacokinetics	Common side effects
Isoniazid(H)	Bactericidal, rapidly metabolizing extra-cellular bacilli	Hepatitis, peripheral neuritis
Rifampicin(R)	Bactericidal, sterilizing, rapidly metabolizing intra-cellular bacilli	Hepatitis, thrombocytopenia
Ethambutol(E)	Bacteriostatic, rapidly metabolizing extra cellular bacilli	Optic neuritis
Pyrazineamide(P)	Sterilizing, extracellular bacilli that persist within the acidic centres caseating granulomas	Hepatitis, arthralgia
Streptomycin(S)	Bacteriostatic	Oto and nephrotoxic

DOSAGES OF FIRST LINE ATT DRUGS FOR CHILDREN

Generic	Brand	Dose mg/kg	Range mg/kg	Max. dose mg/day	Available strength
Isoniazid	Solonax (DT)	10	5-15	300	100mg 300mg
Rifampicin	R-cin (Susp, Cap)	15	10-20	600	100mg/5ml 150mg, 300mg
Ethambutol	Combutol (Tab)	20	15-25	1200	400mg,600mg
Pyrazinamide	(Tab)	35	30-40	2000	400mg,500mg
Streptomycin	Inj.	15	12-18	1000	

- Pyridoxine: tablets 40mg

Regular weight-based dose adjustment is important in children during the course of treatment, as most of the children gain weight, especially during the intensive phase.

FDCs FOR CHILDREN UNDER 8 YEARS

Weight/Kg	Intensive phase (HRZ) (30,60,150)	Continuation phase (HR) (30, 60)
2-2.9	½ tab	½ tab
3-5.9	1 tab	1 tab
6-8.9	1 ½ tabs	1 ½ tabs
9-11.9	2 tabs	2 tabs
12-14.9	2 ½ tabs	2 ½ tabs
15-19.9	3 tabs	3 tabs
20-24.9	4 tabs	4 tabs
25-29.9	5 tabs	5 tabs
30-35	6 tabs	6 tabs

Note: Children older than 8 years are routinely treated as adolescents and adults

5.2 TREATMENT REGIMENS

ATT is given in two phases

INTENSIVE PHASE

- Eliminate the bacterial load and prevent the emergence of drug resistant cases
- At least 3 bactericidal drugs used

CONTINUATION PHASE

- Eradicates the dormant bacilli
- At least 2 bactericidal drugs used to continue and complete the Rx

TREATMENT CATEGORIES

Category	Diagnosis	Regimen	
		Intensive phase	Continuation
New	PTB without cavities or alveolar consolidation	2(HRZ)	4(HR)
	Pulmonary TB with cavities or alveolar consolidation	2(HRZ)E	4(HR)
	TB Lymphadenitis	2(HRZ)	4(HR)
	TB pleural effusion	2(HRZ)	4(HR)
	Pericardial TB	2(HRZ)	4(HR)
	Abdominal TB	2(HRZ)	4(HR)
	TB meningitis	2(HRZE)S*	10(HR)
	Osteoarticular TB	2(HRZE)	10(HR)

*Streptomycin is avoided children when possible because it causes irreversible auditory damage and injection site is painful.

STEROIDS

- Steroids are used for the management of complicated forms of TB, to improve survival and decrease morbidity.
- Prednisolone 1-2mg/kg/day
- Miliary TB, pleural effusion pericarditis or peritonitis- 4-8wks
- TB meningitis – 8-12wks

IMMUNE RECONSTITUTION

- Temporary exacerbation of symptoms, signs or radiographic manifestations sometimes occurring after starting ATT due to the recovery of immune system.
- Commonly occurs after initiation of ART in HIV infected children with TB, and is known as the immune reconstitution inflammatory syndrome (IRIS).
- ATT should be continued, although in some cases the addition of corticosteroids might be useful.

5.3-REFERRAL TO RMC, IGMH

The following children receiving treatment from DOT centers in islands should be referred to IGMH through NTP for assessment

1. All children with severe from of TB, (TBM, miliary TB, TB pericarditis and peritonitis, spinal and skeletal TB)
2. Poor response to ATT (no weight gain, persistent of symptoms after 2-3 months)
3. Side effects of drugs or severe and persistent symptoms of IRIS
4. Children suspected of having drug resistant TB

5.4- FOLLOW UP DURING TREATMENT

Treatment outcomes in children are generally good provided that treatment starts promptly and adherence is maintained until completion. The risk of serious adverse events in children associated with use of the recommended treatment regimens very low. Severe disseminated disease such as tuberculous meningitis is associated with high mortality and with high morbidity among survivors.

All children receiving treatment for TB should be reviewed monthly for the first three months.

1. Assess for resolution of signs symptoms
2. Assess for side effects and toxicities of ATT
3. Monitor weight, and adjust drug dosage as per increased weight
4. Sputum examination at 2, 5 and 6 months of treatment for smear positive PTB
5. Follow up X-rays are advisable in all children with
    - Persistent symptoms or poor response to treatment
    - Any new symptoms develop

6. Routine CBC, RFT or LFT are not required if no side effects observed.
7. Repeat of TST in not required during or after treatment.

5.5-CAUSES OF DETERIORATION DURING TB TREATMENT

Whenever deterioration of symptoms or signs or radiological features are observed, ensure that

- Drug dosage is correct
- Child is given drugs as prescribed
- Child is not HIV infected
- Child is getting adequate nutritional supplements and support
- Diagnosis of TB in the child is correct or not
- Child is not a case of drug resistant TB

Suspect drug resistance in a child who fails to convert at 7 or 11 weeks after excluding non compliance to treatment and first line DST should be conducted. In cases where there was no initial bacteriological confirmation of disease, suspect failure when clinical symptoms are not improving or worsen and x-rays show disease progression. Any child with persistent symptoms or who deteriorates on TB treatment should be referred to Respiratory medicine clinic at IGMH for further assessment and care

5.6Treatment adherence

All children should receive daily DOT by a trained DOT provider (community or family health worker or nurse involved in TB services) throughout the entire treatment as per the policy of NTP.

If this arrangement is not convenient for the family, trained and responsible non health care persons who do not have strong emotional ties with the patient (not the childs parents or immediate family) can provide DOT in such situations.
These arrangements must be approved in advance by the supervisory clinician and should be monitored closely to ensure that there are no problems.

Family members should be used to provide DOT only as a last option if a child or family does not agree to any of the above arrangements and there is a possibility for the caregivers not to report to NTP but obtain ATT from pharmacies from neighboring countries and do self administered therapy. This must again be decided by the supervisory clinician and should be very closely monitored by NTP. Not more than 2 weeks of medicines should be handed over to the family or work supervisor at a time

Family members should not be used as DOT providers in patients with drug resistant TB and patients at a high risk for non adherence

Children, their parents, other family members and other caregivers should be educated about TB and the importance of completing treatment. The support of the child' s parents and immediate family is vital to ensure a satisfactory outcome of treatment.

Whenever possible, FDCs of drugs should be used to simplify drug administration and adherence. Patient treatment cards are recommended for documenting treatment adherence.

Adherence to the full course of therapy is frequently a challenge, especially as clinical improvement can be rapid; most children with TB will start to show signs of improvement after 2-4 weeks of anti-TB treatment.
On assessment at 2 months after the start of treatment, the possibility of treatment failure should be considered if a child who is receiving anti-TB treatment:

- has no symptom resolution or has worsening symptoms;
- shows continued weight loss;
- is sputum smear-positive

6. MANAGEMENT OF COMMON SIDE EFFECTS OF FIRST LINE DRUGS

Adverse reactions of first line ATT

Drug	Adverse reaction	Monitoring	Comments
INH	Rash Hepatitis Peripheral neuropathy Inhibits cytochrome P450	Baseline hepatic enzymes Repeat if - baseline results are abnormal - adverse reactions	Hepatitis risk increases with age Pyridoxine 10-15 mg/kg may prevent peripheral neuropathy and CNS effects
RIF	Induce cytochrome – p450 GI upset, Rash Hepatitis Bleeding problems Flu-like symptoms Renal failure	Baseline CBC, platelets, and hepatic enzymes	Contraindicated or used with caution when administered with PIs and NNRTIs Colors body fluids orange
EMB	Optic neuritis Rash	Baseline and monthly tests of visual acuity and color vision	Not recommended for children too young
PZA	Hepatitis Rash GI upset Hyperuricemia	Baseline uric acid and hepatic enzymes	Treat hyperuricemia only if patient has symptoms May make glucose control difficult in diabetics
SM	Ototoxicity Renal toxicity	Baseline hearing and renal function tests	Ultrasound and warm compresses to injection site may reduce pain

6.1-HEPATOTOXICITY

Drug induced hepatotoxicity is defined as

1. AST/ALT >= 3x upper limit of normal (ULN) with the presence of symptoms; OR
2. AST/ALT >5x ULN in the absence of symptoms; OR
3. Disproportional increase in alkaline phosphatase and total bilirubin.

It usually occurs during the first 3 months of treatment.

The incidences of hepatotoxicity are ranged as the following (from high to low): INH>PZA>RIF.

EMB can be used safely in patients with hepatic disease.

INH is contraindicated in patient with active hepatitis and end stage liver disease.

How to manage liver toxicity

- If LFT (**AST/ALT**) <5x ULN and no symptoms, continue with the regimen and monitor LFT weekly.
- If alkaline phosphatase and bilirubin are disproportionally increased, STOP Rifampicin.
- If LFT>=3x upper limit of normal PLUS symptoms; or LFT >=5x ULN with or without symptoms:
    - STOP immediately all antituberculosis drugs.
    - Perform serology for Hepatitis A, B, and C
- In acutely ill and AFB positive patients in whom, ATT needs to be continued, three **liver friendly** anti-tuberculosis drugs should be introduced (e.g., ethambutol, an aminoglycoside and a fluoroquinolone) and continued until causes of liver toxicity are identified.

How to re-challenge anti-tuberculosis drugs

- If LFT <2x ULN, start with Rifampicin
- If weekly LFTs do not increase, then add INH followed by PZA next week.
- If at any time of re-challenged period, symptoms recur or AST increases then STOP the last drug added

6.2-GASTROINTESTINAL INTOLERANCE

- GI upset symptoms are very common and usually occur in the first few weeks of therapy
- Any anti-TB drugs can cause GI upset

How to manage GI upset

- Recommend changing hour of drug administration, preferably closer to meal time
- If patient is not on DOT, medication can be taken at bedtime

- Take medication with a light snack.
- Avoid antacid 1 hour before and 2 hours after INH administration (aluminum salt-containing antacid reduces INH bioavailability)
- If GI symptoms persist or worsen;
    - Rule out other possible causes of hepatotoxicity
    - drugs induced GI upset
    - Perform LFTs. If ALT/AST >=3x ULN, assume it is liver toxicity. Stop antituberculosis drugs.
    - HYDRATION! Important to encourage patients to increase fluid intake.

6.3-RASH

All anti-TB drugs can cause rash. Management depends on its severity:

- Mild rash or itching →antihistamine (Benadryl) 30 minutes before ATT and continue ATT
- Petechial rash →CBC, if the platelet count is below normal, stop RIF and never restart it again. Monitor the platelet count until it returns to baseline.
- Erythematous rash with fever, and/or mucous membrane involvement:
    - STOP ALL drugs immediately
    - Rule out anaphylaxis and Stevens-Johnson Syndrome

- If severely ill with tuberculosis, try second-line drugs such as injectable streptomycin, amikacin) and any 2 oral agents
- If rash has improved substantially, restart ATT **one by one and after every 3 days**.
- start with RIF followed by INH, PZA and EMB
- If rash recurs at any point; STOP last added

6.4-PERIPHERAL NEUROPATHY

- The primary agent that causes peripheral neuropathy is INH.
- Commonly seen in the malnourished (vitamin B6 deficiency), diabetes, HIV, renal failure and breastfeeding women.
- It is dose related and uncommon at conventional INH dosage.
- Commonly observed in:
    - Malnourished,
    - HIV-infected

- Breastfeeding infants

Management

- Prevention is the key!
- Pyridoxine (vitamin B6) prophylaxis 10 mg Pyridoxine for every 100 mg INH is recommended

6.5-OPTIC NEURITIS

Causes a decrease in visual acuity and may lead to irreversible blindness

Management

- Baseline and monthly visual acuity tests while on EMB
- More than 10% visual loss is considered significant
- If there is a defined fluctuation of 2 lines of the Snellen chart, STOP the EMB immediately and permanently if decrease in visual acuity is confirmed.
- EMB is not recommended in children under 5 years old and children whose visual changes are difficult to monitor.

7. DRUG RESISTANT TUBERCULOSIS

Even though there is no drug resistant TB documented in children in Maldives, drug resistant Tb is increasing among the adult population. Drug resistant TB in children usually develops within 12 months of infection. Contact tracing and close follow up of children exposed to drug resistant TB should be done with high priority.

MONO DRUG RESISTANCE: MTB is resistant to only one of the first line ATT
POLY DRUG RESISTANCE: MTB is resistant to more than one of the first line ATT other than both INH and Rifampicin

MULTI DRUG RESISTANCE (MDR-TB): MTB is resistant to both isoniazid and rifampicin with or without resistance to other first line ATT

EXTENSIVELY DRUG RESISTANT (XDR-TB): MDR-TB that is also resistant to any one of the fluoroquinolones and to at least one of three injectable second line ATT (Amikacin, Capreomycin, Kanamycin)

FEATURE OF DRUG RESISTANT TB

Drug resistant TB should be suspected in any child with the following features

1. INDEX CASE
    - Remaining smear positive after 3 months of first line ATT
    - H/O previous ATT interruption or recurrence after completion of treatment
2. CHILD
    - H/O contact with a know case of MDR-TB
    - Not responding to adhered standard first line ATT
    - Recurrence after completing ATT

DIAGNOSIS OF MDR-TB IN CHILDREN

MDR-TB is a laboratory diagnosis. Younger children may not be able to produce specimen, but every effort should be made to obtain specimens for culture. Appropriate specimens for culture include induced sputum, tissue biopsy, gastric aspirate, urine and /or stool.

7.1-STANDARD SECOND LINE DRUGS FOR MDR-TB IN CHILDREN[2]

Second line anti-TB drugs are generally more toxic but with correct dosing, serious adverse reactions are minimal in children.

Standard MDR –TB regimen should be given for a minimum of 20 months and at least 18 months past conversion.

Intensive phase regimen 8(Km-Z- Lfx-Eto-Cs) + 12 (Lfx-Eto-Cs-Z)

Second-line drugs	Mode of action	Common side effects	Daily dose	
			Dose (mg/kg)	Max dose(mg)
Ethionamide (Eto)	Bactericidal	Vomiting, indigestion	15– 20	1000
Ofloxacin (Ofx)	Bactericidal	Arthropathy, arthritis	15– 20	800
Levofloxacin (Lfx)	Bactericidal		7.5– 10	
Moxifloxacin (Mfx)	Bactericidal		7.5– 10	
Gatifloxacin	Bactericidal		7.5– 10	
Kanamycin (Km)	Bactericidal	Ototoxicity,nephrotoxicity	15– 30	1000
Amikacin (Am)	Bactericidal		15– 22.5	1000
Capreomycin (Cm)	Bactericidal		15– 30	1000
Cycloserine (Cs)	Bacteriostatic	Psychiatric, neurologicam	10– 20	1000
Paraaminosalisylic acid (PAS)	Bacteriostatic	Vomiting, gastrointestinal upset	150	12gm

TB-HIV CO-INFECTION

HIV-infected children are at increased risk of developing TB due to weakened immune system and are prone to develop multiple episodes of TB if they are not treated for HIV. HIV related lung diseases (PCP, LIP, viral or bacterial pneumonia) may mimic the diagnosis of TB in children.

All TB children with suspected HIV co-infection should tested after appropriate counseling for children/parents

- Mother known to be HIV infected
- Mother with high risk behaviors
- Children with recurrent TB or suspected drug resistant TB

8. MATERNAL TUBERCULOSIS

All pregnant women who are exposed to a person with smear positive TB should be thoroughly assessed and a clear distinction has to be made between LTBI and active TB disease.

- TST should be done in all exposed pregnant women (pregnancy does not alter the response to TST and there have been no adverse reactions on women or fetus).
- Whenever the TST is positive, a complete history and physical examination is mandatory and if clinical manifestations of TB disease are present, CXR (with appropriate abdominal shielding) should be obtained.
- IPT is differed till delivery in asymptomatic women
- Pregnant women with active TB should be treated with 2HRE+4HR
- Once on treatment for at least 2– 3 weeks, she is generally no longer infectious and it is less likely that the baby will become infected.
- If a pregnant woman is found to have pulmonary TB shortly before delivery, then the baby, and if possible, the placenta should be investigated for evidence of congenital TB infection

8.1 CONGENITAL TUBERCULOSIS

Neonates are at greater risk of developing serious form of extrapulmonary tuberculosis, including meningitis, miliary TB and bone etc.

Signs and symptoms of TB in Neonates

Clinical manifestations of TB neonates are very nonspecific and vary in relation to the duration, mechanism and location in the infant.

Clinical manifestation	Percentage (%)
Live and spleen enlargement	76
Respiratory distress	72
Fever48	48
Lymphadenopathy	38
Abdominal distension	24
Lethargy and irritability	21
Ear discharge	17
Skin papules	14

INVESTIGATING A NEWBORN FOR TB

- All neonates with suspected TB should have a TST, CXR, LP and cultures done immediately after birth.
- Placenta should be sent for culture and histopathology

TREATMENT FOR TUBERCULOSIS IN NEWBORN

- Infants with active disease should receive 2 (HRZ+amikacin) +4HR
- Infants with TB meningitis should receive 2 (HRZ+amikacin) +7 to 10 HR and prednisone 2mg/kg 4-6 weeks

NEONATES WITH TB EXPOSURE IN THE NURSERY

- Neonates exposed to TB in the nursery have a low risk if acquiring TB disease, but they can acquire infection.
- If the exposure is considered significant, do TST and start IPT immediately (no need to wait for TST report)
- If first TST negative, do a second TST at 3 months, if negative stop IPT and give BGC, and closely monitor for symptoms.
- If TST positive, 9 months IPT recommended for neonates.

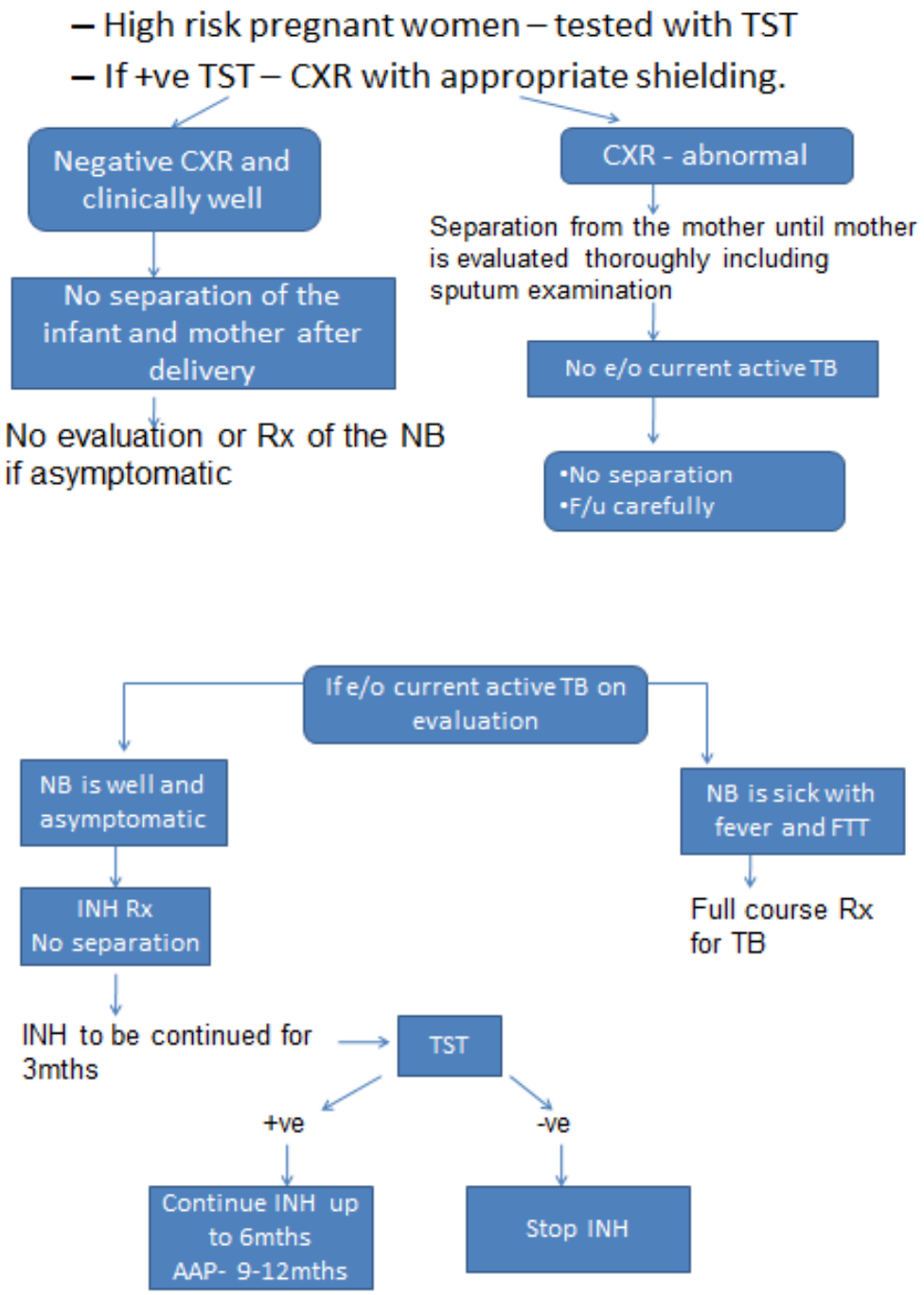
8.2- INFANT OF A BREASTFEEDING MOTHER WITH SMEAR-POSITIVE PTB

- A breastfeeding infant has a high risk of infection from a mother with smear-positive PTB, and has a high risk of developing TB.
- The infant should receive 9 months of isoniazid preventive therapy, followed by BCG immunization.
- An alternative policy is to give 3 months' isoniazid, then perform a TST.
    - If TST is negative, isoniazid should be stopped and BCG vaccination given.
    - If TST test is positive, isoniazid should be continued for another 3 months, after which it should be stopped and BCG given.
- Breastfeeding can be safely continued during this period.

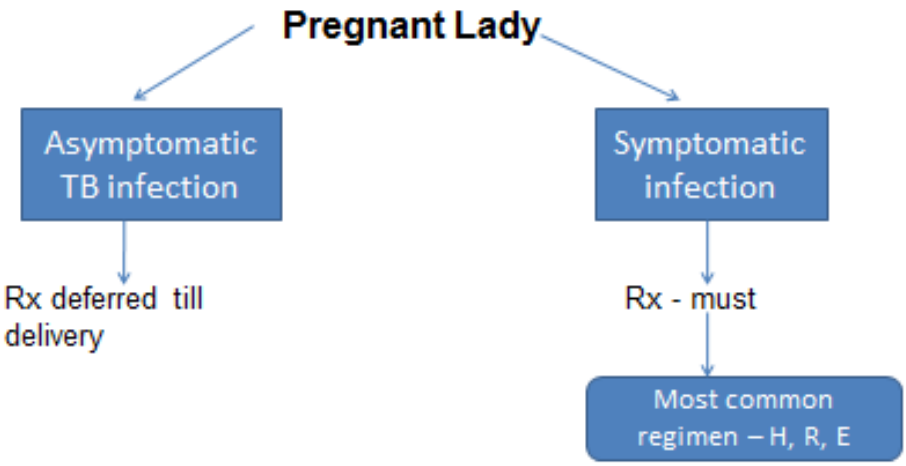
WHEN TO SEPARATE THE NEWBORN FROM THE MOTHER?

- Mother has active disease (until infant is receiving IPT and mother is non-infectious).
- Mother is ill enough to require hospitalization
- Mother expected to become non-adherent with her Rx
- Drug resistant TB

8.3- PERINATAL TB



8.4-TB DURING PREGNANCY



- Avoid – aminoglycosides and ethionamide – teratogenic
- Safety of pyrazinamide in pregnancy is not established.

9. PREVENTION OF TB IN CHILDREN

1. Childhood BCG immunization:

A single dose of BCG vaccine should be given to all infants as neonatal BCG vaccination provides substantial protection against the more severe types of disseminated TB, such as miliary TB and tuberculous meningitis, to which infants and young children are particularly susceptible

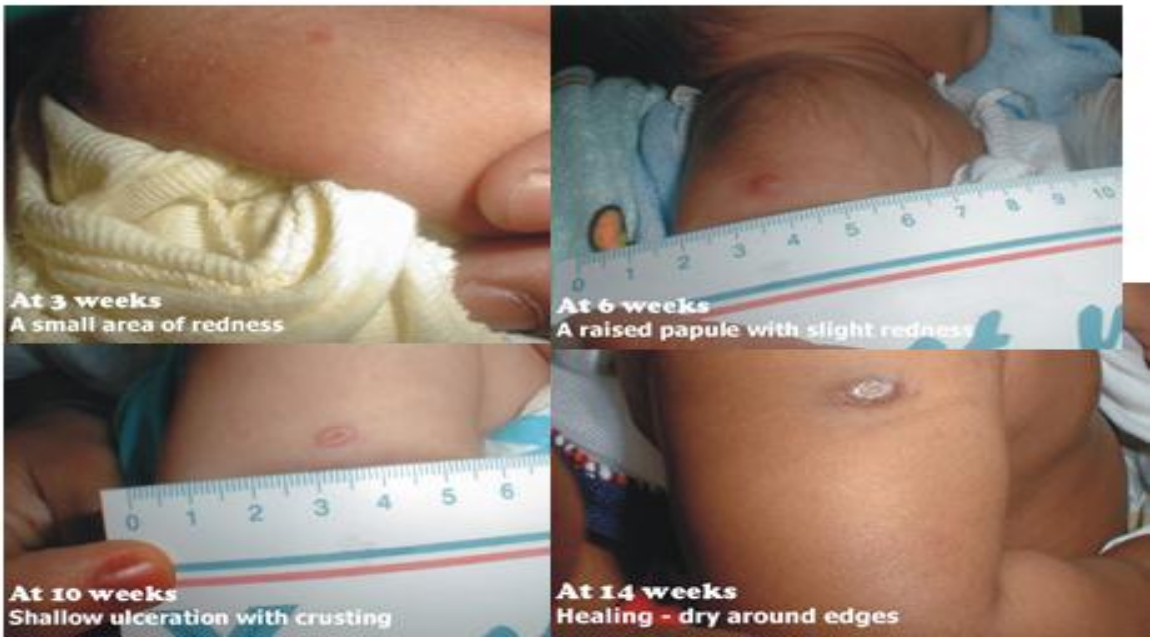
In children who are known to be HIV-infected, BCG vaccine should not be given because of the increased risk, reported from some settings, of severe and often fatal disseminated BCG disease

2. Case detection and treatment

9.1 BCG (BACILLE CALMETTE-GUÉRIN) VACCINATION

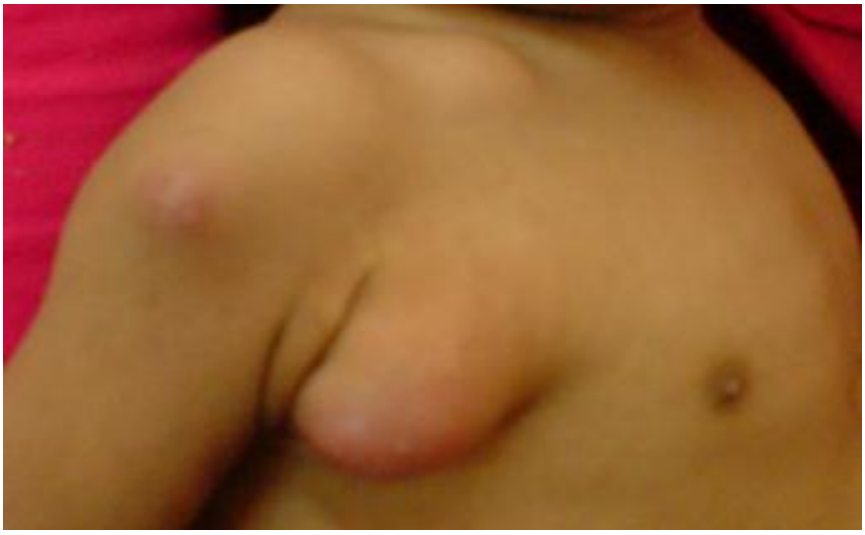
- Strain of M. bovis attenuated by subculture
- Administration – 0.1ml, intra-dermal
- Age – during infancy, single dose, including asymptomatic children.
- Extremely safe in immunocompetent host
- Local ulceration and regional suppurative adenitis – 0.1-1%.
- 50% effective in preventing pulmonary TB in adults and children.
- Protective effect for disseminated and meningeal TB – 50-80%.
- BCG vaccination administered during infancy has little effect on incidence of TB in adults, suggesting that the effect of vaccine is time limited.

NATURAL HISTORY OF BCG VACCINATION



BCG ADENITIS IN HIV-NEGATIVE

- Estimated incidence 3-15%
- Associated with vaccine technique
- No evidence of benefit of systemic or local TB therapy
- Role of surgery:
    - Diagnosis (FNAC); purulent or non-resolving lesions
    - Small masses – observation
    - Large/painful masses – repeated aspiration or I&D



10. CONTACT SCREENING AND PEDIATRIC LTBI TREATMENT

DEFINITIONS USED IN CONTACT SCREENING

SOURCE CASE	A case of pulmonary TB(usually smear positive)which results in infection or disease among contacts
CONTACTS FOR SCREENING	All children aged under 5 years (whether sick or well) and children older than 5 years if symptomatic, who are un close contact with the source case.
CLOSE CONTACT	Living in the same household as the source case or in frequent contact with the source case (close relatives, neighbors, friends, teachers etc.)

Children usually acquire TB from adults with active pulmonary tuberculosis. Children usually develop disease within 2 years of exposure and most (90%) cases develop within the first year. Therefore, **history of close contact with a patient with smear positive pulmonary TB within the last year is a strong indication of possible TB.**

Clinical assessment alone is sufficient to decide whether the contact is symptomatic or not. Hence, routine evaluation of exposed contacts does not require CXR or TST. Enquire if the suspected index case;

- Is receiving TB treatment for the first time
- is adherent to treatment
- is responding to the treatment

10.1-SYSTEMATIC TUBERCULOSIS SCREENING

Systematic screening for active TB is defined as the “ systematic identification of active TB disease in children using examinations and procedures that can be applied rapidly. The primary objective of TB screening is to ensure early detection of TB disease and initiation of treatment.

Screening should be offered routinely to all children presenting to the health facility. High risk groups who should be routinely screened include;

- children who live in the same household with a person diagnosed with smear and/or culture positive PTB
- HIV positive children
- children less than five years
- children with severe malnutrition

The systematic screening should include a symptom screen followed by thorough history taking, clinical examination, chest x-ray and bacteriological testing. For all those with a positive symptom screen, a chest x-ray will be done to screen for PTB in children.

If the child is the index case with TB, active case finding should be undertaken to determine the source case.

Information about any person in the household diagnosed with or has symptoms of TB and other possible places of exposure should be obtained from the parent or guardian.

PURPOSES OF SCREENING CHILD CONTACTS

1. Identify symptomatic children (i.e. children of any age with undiagnosed TB disease) and provide prompt treatment
2. Provide preventive therapy for susceptible individuals (i.e. all asymptomatic children under 5 years of age[3])

TB Symptomatic screening

The most common symptoms in children are:

- Cough of two weeks or more
- Persistent fever of more than two weeks
- Documented weight loss/ failure to thrive
- Fatigue (less playful/ always tired)

All children with one or more of the TB symptoms must be investigated accordingly for TB

METHOD

1. Clinical examination.
2. TST.
3. Chest x-ray P/A and Lat view.
4. Evaluate for **Window Period** (A second TST should be placed 12 weeks after the last known exposure to infectious TB).

WHO SHOULD RECEIVE IPT

1. All infants and children <5 years who have a **positive TST result but with no evidence** of TB disease.
2. All infants and children <5 years of age, even with negative TST (<5mm), **who have been close contacts** of infectious persons within the past 3 months (window Period).

ISONIAZID PREVENTIVE THERAPY (IPT) FOR LTBI

- Initiate therapy even before the TST result is available.
- The recommended duration is 6 months.
- INH 10mg/kg is given daily in a single dose. When adherence with daily therapy cannot be ensured, twice-a-week DOT can be considered.
- Pyridoxine (vitamin B6) 10 mg for every 100 mg INH is recommended
- The following medication nomogram is adapted based upon recommendations of Ann Loeffler, M.D., Francis J. Curry National Tuberculosis Center, California

Isoniazid Daily Dose				
Child's weight		Daily isoniazid dose (10-15 mg/kg)		
Pounds	Kilograms	Milligrams	100mg tabs	300 mg tabs
6.6 – 11	3 –5	50 mg	0.5	0
11.1 – 16.4	5.1 – 7.5	75 mg	0.75	0
16.5 – 22	7.6 – 10	100 mg	1	0
22.1 – 33	10.1 – 15	150 mg	0	0.5
33.1 - 44	15.1 – 20	200 mg	2	0
Over 44	Over 20	300 mg	0	1
Maximum isoniazid daily dose is 300 mg				

WHEN TO DISCONTINUE INH PREVENTIVE THERAPY FOR LTBI

1. The recommended minimum duration is 6months for all TST positive asymptomatic children < 5 years
2. For exposed children <5 years of age with **initial negative TST (<5mm),** if the second TST performed at 12 weeks is also negative (<5mm), IPT may be discontinued, **provided that the second TST was performed at least 12 weeks after the child was last exposed to infectious TB**.

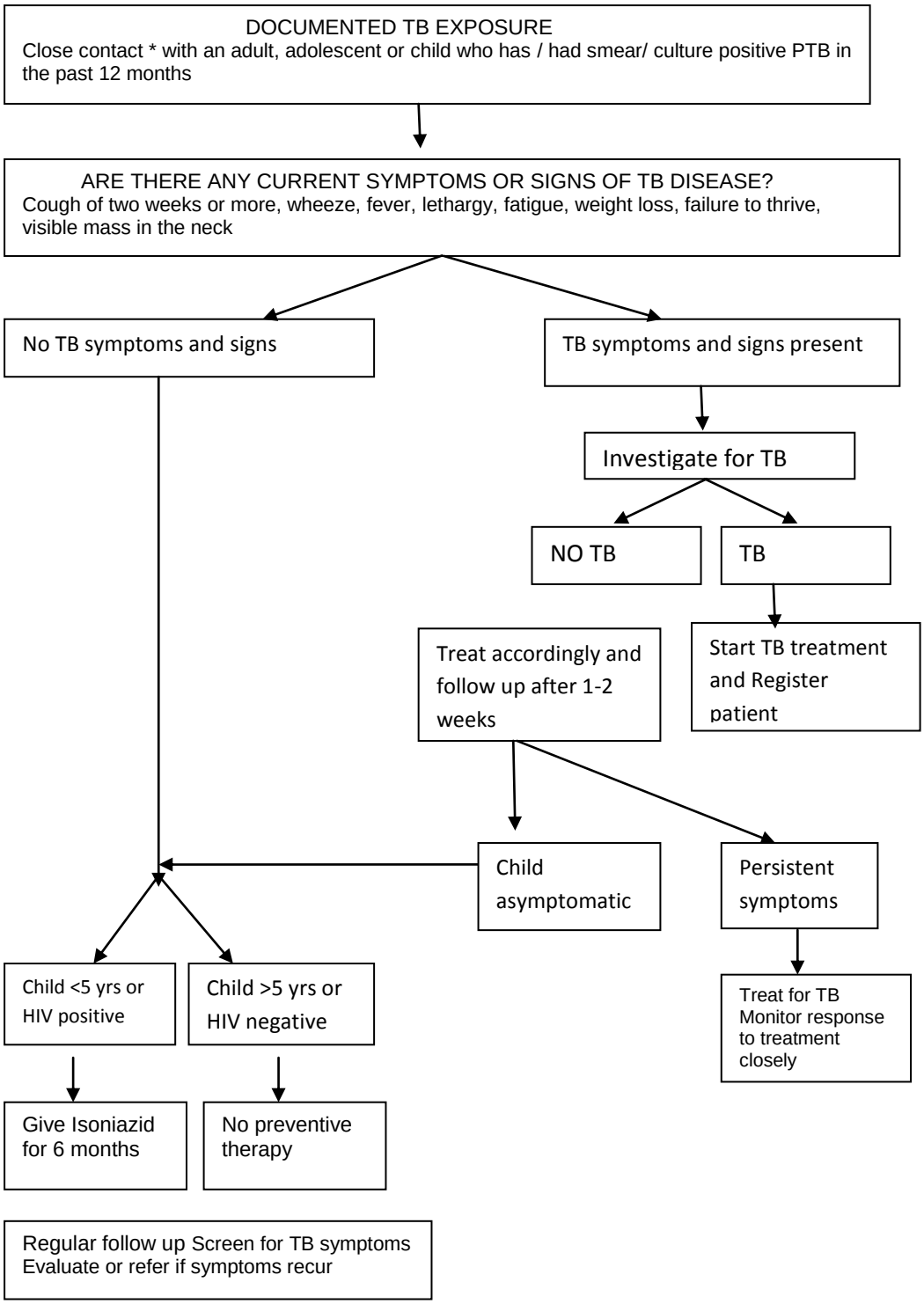
CHILD CONTACT IS KNOWN TO BE HIV-INFECTED

- If the child contact is HIV-infected and asymptomatic, then IPT should be considered for all ages.
- As with other contacts, active disease should be ruled out before providing HIV-infected children with IPT.
- HIV infected children who have symptoms should be carefully evaluated for TB, and if found to have TB should be registration and initiation of treatment.

CLOSE CONTACTS OF MDR-TB

- Patients should receive careful clinical follow up for at least 2 years.
- If active disease develops, prompt initiation of treatment with a regimen designed to treat MDR-TB is recommended.
- On the basis of the currently available evidence, the WHO does not recommend second-line drugs for chemoprophylaxis in MDR-TB contacts.

10.2-Algorithm for TB screening



11. MANAGEMENT OF TB IN CHILDREN LIVING WITH HIV

Children living with HIV infection have increased risk of TB exposure, infection, progression to disease, and TB-related morbidity and mortality. This risk is influenced by the degree of immune suppression.

All children living with HIV infection should be screened for TB and should aim to identify those who are likely to have TB disease, requiring anti-TB treatment, and those who should start IPT.

Suspicion of TB disease in children with HIV is initially based on the presence of clinical symptoms. Clinical evaluation may be followed up with further investigations as appropriate (e.g. chest radiography). As for any child with suspected TB, attempts should be made to confirm diagnosis (e.g. culture, Xpert MTB/RIF assay) whenever possible

Similarly it is recommended that HIV testing be routinely offered to all children with suspected or diagnosed TB

11.1- DIAGNOSIS

The diagnosis of TB in children living with HIV is the same as for diagnosis in HIV-negative children, as described above in Chapter 3. But this can be more challenging in children living with HIV for the following reasons:

- Clinical features consistent with pulmonary TB are common in children living with HIV but may be due to other diseases and therefore lack specificity for a diagnosis of TB.
- Most children are HIV infected by mother-to-child transmission. The peak age prevalence for HIV is therefore in infants and young children (<5 years), who also make up the age group in which it is most difficult to confirm the cause of acute or chronic lung disease, including TB.
- TST is less sensitive in children living with HIV than in HIV-negative children; induration of >5 mm is considered positive if the child is living with HIV.
- Children living with HIV have a very high incidence of acute and chronic diseases other than TB.
- Children living with HIV may have lung disease of more than one cause (co-infection), which can mask response to therapy.
- There is an overlap of radiographic findings in TB and other HIV-related lung disease.

11.2 PREVENTION OF TB in HIV

All children living with HIV should be screened for TB and all children (and their families) with TB should be offered HIV testing and counselling.

Irrespective of age, all children living with HIV who are household contacts of infectious TB cases should be evaluated for TB disease and either treated for TB or given preventive therapy if screening finds that they are unlikely to have TB disease

It should be ensured that co-infected children are identified and that, where possible, disease is prevented which requires integration of services and collaboration by both the national TB and HIV programmes.

BCG vaccination

BCG vaccination should not be given to infants or children with known HIV infection because of the risk of disseminated BCG disease

Contact screening and case-finding

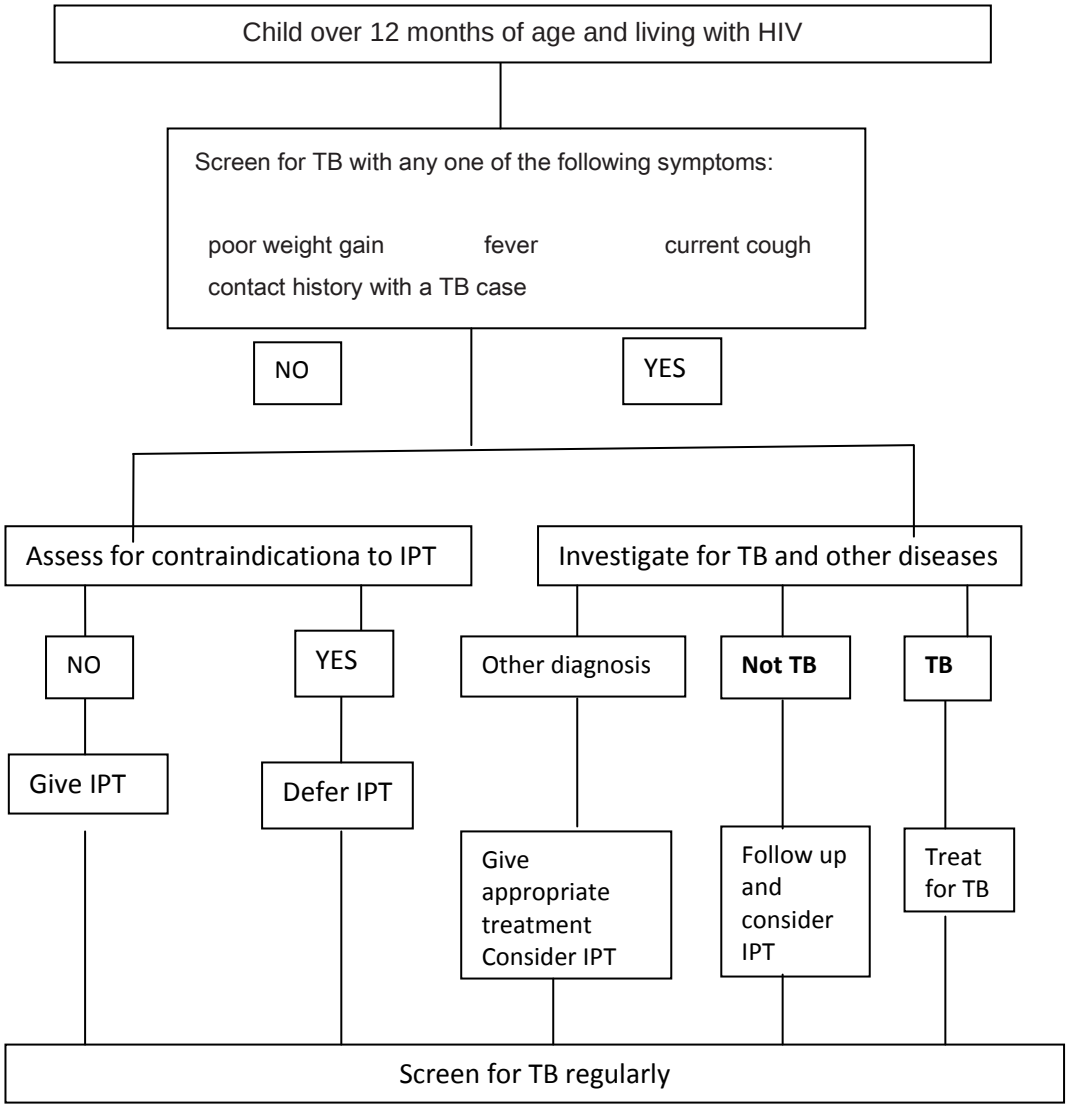
A child living with HIV who is exposed to an infectious case of TB is at particular high risk of developing TB disease

All household contacts of an infectious case of TB should be screened for symptoms of TB and that, if TB is excluded, preventive therapy should be offered to:

- HIV-negative children aged less than 5 years; and,
- HIV-positive contacts of any age.

Children living with HIV who are more than 12 months of age and who are unlikely to have TB disease on symptom-based screening and have no contact with a TB case: may be offered 6 months of IPT (10 mg/kg per day, range 7– 15 mg/kg, maximum dose 300 mg/day) as part of a comprehensive package of HIV prevention and care services

11.3-Algorithm for TB screening and IPT in children >12 months of age with HIV



11.4 TREATMENT OF TB (IN CHILDREN LIVING WITH HIV)

Children living with HIV with TB should be treated with a four-drug daily regimen (HRZE) for 2 months followed by a two-drug regimen (HR) for 4 months

Each child should be assessed 2 weeks after the start of TB treatment then reviewed monthly with clinical monitoring, which should include symptom assessment, weight measurement, assessment of adherence to treatment and enquiry about any adverse events.

Dosages of anti-TB drugs should be adjusted to account for any weight gain.
Most children living with HIV with drug-sensitive TB who are compliant with therapy have a good response to the 6-month regimen. Possible reasons for treatment failure are non-compliance with therapy, drug-resistant TB or alternative diagnoses (incorrect diagnosis of TB).
All children living with HIV who have successfully completed treatment for TB disease should receive isoniazid for an additional 6 months

When compared with HIV-negative children, responses to TB treatment and outcome are poorer for children living with HIV. Medical risk factors for poor treatment response and mortality include severe malnutrition, coinfections, severe immunosuppression and high viral load.

Additional therapy recommended for HIV-infected children with TB, which may help to improve TB treatment outcomes, includes co-trimoxazole preventive therapy, the early start of ART and pyridoxine supplementation along with nutritional support

11.5 ANTIRETROVIRAL THERAPY

Collaborate with National HIV programme for co infected patients to ensure ART provision and address other issues regarding trearment, adherence etc

Antiretroviral therapy in children living with HIV aims to improve the length and quality of life, reduce HIV-related morbidity and mortality by reducing the incidence of opportunistic infections (including TB), reduce the viral load, restore and preserve immune function, and restore and preserve normal growth and development. ART
improves TB treatment outcomes for children living with HIV.

ART should be provided to all people with a confirmed HIV diagnosis and a CD4 count of 500 cells/mm³ or less, giving priority to those with severe/advanced HIV disease or a CD4 count of 350 cells/mm³ or less. WHO also recommends that ART
be initiated in people with active TB and HBV co-infection with severe liver disease, all pregnant and breastfeeding women with HIV, all children younger than 5 years living with HIV and all individuals with HIV in serodiscordant relationships, regardless of CD4 cell count.

TB treatment should be started first, followed by ART as soon as possible thereafter (and within 8 weeks of the start of TB treatment). For those with a CD4 count below 50 cells/ mm^3, ART should be provided within 2 weeks of the start of TB treatment

.

For first-line ART, use of simplified and less toxic regimens – as fixed-dose combinations whenever possible – is recommended as the most effective and convenient approach.

Regimens comprising of a nucleoside reverse transcriptase inhibitor backbone (tenofovir or abacavir) + lamivudine and one non-nucleoside reverse-transcriptase inhibitor (efavirenz) are maintained as the preferred choices in adolescents and children older than 3 years. For children younger than 3 years, a protease inhibitor based regimen is the preferred approach in combination with Abacavir or zidovudine

12. National TB control program

Introduction

Tuberculosis was a significant public health problem in Maldives, causing a considerable burden of disease and for this reason, the national TB control programme (NTP) was created in 1962.

The National TB control program, at Health Protection Agency (HPA) continues to act as the central body for registration, planning, monitoring and evaluation of the TB control activities.

DOTS, the internationally recommended strategy for TB control were introduced in1994 and nationwide coverage was achieved by1996. Since then, Maldives have achieved considerable progress in decreasing the incidence of TB in the country but the notification rate of all forms TB and new smear – positive cases were respectively 33 and 15, has been showing an increase compared to the steady decrease over the previous 5 years

Maldives is one of only 5 countries in the world to have achieved the global targets of 70% case detection and 85% cure. This information is referred from WHO referral letter no. T/26 dated on 27th April 1998.

Anti tuberculous drugs are available through NTP and tuberculosis treatment is free of charge for all patients on treatment and chemoprophylaxis.The NTP activities are well integrated in the general health care system. Diagnosis of sputum-positive cases is possible through a network of microscopy centers in the country, while treatment is available through all health facilities.

The Respiratory Medical Clinic at IGM Hospital (the only government tertiary referral hospital) is the main referral centre for management of Tuberculosis

The proportion of children among all detected cases has remained at around 6% during recent years, significantly below the generally expected proportion of about 11%. The low proportion may result from inadequate diagnosis of childhood TB, as well as lack of access to specific diagnostic methodologies, such as molecular tests for TB.

It is important that regular and routine training or updates with NTP staff include attention to child TB. Issues relating to child TB, in particular those that are peculiar to child TB should be integrated into ongoing training and updates, rather than being addressed in a separate forums and Integration would be the more efficient and cost effective way of including child TB in NTP activities,

Recording and reporting mechanism

NTP maintains a national register of TB patients. The register is updated quarterly by input of reports form RMC, Regional and Atoll Health Facilities but this is an area which needs to be strengthened. The RMC at IGMH has established an electronic register however, worksheet functions are rather simple and do for instance not allow for the automatic evaluation of treatment outcomes. Recording and reporting at peripheral facilities is currently solely paper-based, although computers and internet connections exist at all facilities.

The reporting of childhood TB is low in the Maldives and this should be taken for special attention by the National TB Program and Child data are vitally important for monitoring and evaluation of child TB activities by NTP.
NTP data should include children by age groups, disease types and but importantly child TB cases should be recorded and reported by the same disease categories, by age groups and by outcomes in the same way as TB cases in adults

Supervision, monitoring and evaluation of DOT centre

Monitoring and supervision especially at peripheral levels need to be strengthened as monitoring is an essential management tool to ensure that the programme is achieving its stated objectives, and maintaining the quality of activities. It includes reports on case finding and outcome of treatment, and regular supervision. Direct monitoring consists of site visits, which could be undertaken as part of regular supervision activities

Supply of drugs

Anti TB drugs are available only through NTP and public health services and cannot be purchased from private pharmacies or by any other means. (except for 2 second line drugs ie quinolones and amikacin that is used for treating other infections as well)

All private health care providers including private hospitals refer TB suspects to the NTP for further management.

NTP introduced fixed dose combination of anti TB drugs in the program starting from 2005, with support from Global Drug Facility and free medications are available for all patients.

Once patient is registered at the central level a full course of treatment is supplied to the respective health facility. Two patient treatments worth supplies are kept at the Atoll or Regional level as buffer stock.

All Regions report stock levels on monthly basis using a standardized form which contains information such as stock levels at the beginning / end of month, amount used during the reporting period, date supplies received and expiry dates of the existing stock.

Annexe 1. SOP for TB contact screening and management

Number: HPA/SOP/CD/TB/01

Date: 24th April 2013	**SOP-01**
First Edition	

Tuberculosis Contact Screening and Management SOP

Contact screening will be carried out by the Respiratory Medicine Clinic (RMC) at IGHM or the Tuberculosis focal points at all atoll hospitals.

Mass contact screenings will be coordinated by NTP central unit at HPA for Male', and NTP atoll focal points for atolls. A mass screening session may be organized for the initial screening as below, to be followed up and screening completed at RMC or atoll hospitals. An information session should be carried out before the mass screening session, and also after completing the screenings. Additional information sessions may be required following the initiation of screenings, as it is difficult for lay people to understand all the information about TB at one sitting.

Indications for Contact Investigation and Screening

Contact investigation is required for all cases of TB who are infective, and for children diagnosed with TB to identify a source of infection and treat the person. Contact investigation is indicated for all patients diagnosed with:

1. Sputum positive TB
2. TB in a person living with HIV/AIDS
3. Children < 5 years (to identify source and treat)
4. Multi-drug resistant TB (MDR-TB or XDR-TB (proven or suspected)

Contact investigation should be commenced as soon as possible once the patient has been started on treatment and counseled, and is ready to cooperate. A new patient may be expected to take upto about a week to adjust and be ready to cooperate. Investigation should begin at least within the first 1-2 weeks. A separate guideline will be available for contact investigation and identification.

Initial Contact screening (Step 1):

Requires a **Symptoms survey** + **Mantoux test** for all contacts.

Symptom survey:

- Cough > 3 weeks
- Weight loss
- Fever

- Blood in sputum or coughing blood
- Shortness of breath
- Chest pain
- Enlarged cervical lymph nodes

1. If symptoms (esp, cough) (+)ve, investigate as suspected patient (as in guideline). Give Mantoux and immediately arrange for Sputum test and CXR (for children <15yrs both AP+lat view) without waiting for Mantoux results.
   Arrange doctor consultation with test results.

2. If symptoms (-)ve, go to step 2:

   Step 2 of contact screening for asymptomatic persons:
   a. Mantoux negative, --> check exposure period –
      i. If more than 8 weeks after exposure, can be reassured and discharged with advice.
      ii. If less than 8 weeks from exposure - repeat screening with symptom survey and Mantoux after 8-12 weeks.

   b. Mantoux (+)ve→ do CXR.
      i. CXR abnormal → do sputum tests
      ii. CXR normal, - Latent TB (LTBI)

   ESR has no role in contact investigation or follow-up.

   Arrange doctor consultation with test results. Same day consultation if sputum (+)ve.

Note: If there is any practical difficulty in obtaining test results within the expected time (72 hours for Mantoux and 3-4 days for 3 sputum samples), NPT focal point and hospital care provider should facilitate an early doctor consultation to sort out any problems and get an early diagnosis.

NTP at atoll and central level is responsible for facilitating early diagnosis and treatment.

Prioritization for large number of contacts:

Where facilities are limited, early completion of tests and consultation should be prioritized in the following order:

1. Symptomatic contacts who are severely ill or have cough
2. Symptomatic contacts without cough and not severely ill
3. Asymptomatic contacts with high risk of TB disease (children below 5 years or immunocompromised)
4. Asymptomatic contacts with low risk of developing TB disease

Expected Outcomes from contact screening:

1. Well (No TB infection) – discharge with advice (should include advice on TB symptoms). If exposure is less than 10 weeks, follow-up and repeat screen after 8-12 weeks.

2. LTBI – Not all persons with LTBI need chemoprophylaxis. For high risk groups, see protocol below for prophylactic treatment.
3. TB disease- Start anti-TB treatment according to protocol.

Prophylactic treatment for high risk contacts:

1. All children below ≤5 years and persons who are immunocompromised (persons living with HIV, or on immunosuppressant therapy) should receive chemoprophylaxis with single drug regime of isoniazid for the prescribed period according to the national guidelines.

2. Immunocompromised persons should be followed up closely to watch for development of TB diisease.

3. Adults and children above 5 years diagnosed with LTBI should be evaluated for risk status and if high risk, to recommend prophylactic chemotherapy. If low-risk, to advice to watch for TB symptoms and review if any symptoms develop to re-assess.

Annexe : TB treatment card

NATIONAL TUBERCULOSIS CONTROL PROGRAMME

HEALTH PROTECTION AGENCY
MINISTRY OF HEALTH
TUBERCULOSIS TREATMENT CARD

TB NO.:	**REGISTRATION DATE**: …… **DD/MM/YYYY**	**Treating Center:**……	**Type of TB:** ☐ PTB - Sputum smear Positive (P+) ☐ PTB - Sputum smear Negative (P-) ☐ EP TB (site): ……..
Name: …… ……. Age: YY/MM Sex: ☐ Male ☐ Female		Permanent Address: ……..…… Residential Address……..…… Treatment Supervisor: …… Supervisor Contact Address: ……..	

Any TB Treatment before? ☐ **YES** ☐ **NO** Last regimen (Rx category) Was full treatment completed? ☐ **YES** ☐ **NO**

Previous TB No:	**Treatment** Completed/Cured/Stopped	**Day**	**Month**	**Year**
Details on Patient Movements Referred to : …… ……Referred Date : …… …… Reference Chit No.: ……	……..... ……..... …….....	…… ……... ……...	…… …… ……	…… …… …… …… ……

Registration Category		**Treatment Category**	**Planned duration (mths)**	**Month**	**Results of sputum examination**								**Weight (kg)**
					Local Lab			**Reference Lab**					
					Date	Smear	Lab. No.	Smear	Cult	Sensitivity		
										Sens	Res.	
New		New		0									
Relapse		Retreatment		4 wks									
Failure		Retreatment		2 mnth									
Returned Defaulter		OTHERS		4 mnth									
Transfer In				6 mnth									
Other				Rx End									

TB Treatment card……

TREATMENT SCHEDULE: (place a tick (✓) for each date after giving drugs as DOTS)

1. Intensive Phase

Treatment Start Date: _DD_/_MM_/_YYYY **Planned duration (mths):**_____
Planned End Date: _DD_/_MM_/_YYYY
Medicines: ☐ INH, ☐ RIF ☐ ETH, ☐ PRZ, ☐ _____ ☐ _____

No. of Tabs

ONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

2. Continuation Phase

Treatment Start Date: _DD_/_MM_/_YYYY **Planned duration (mths):**_____
Planned End Date: _DD_/_MM_/_YYYY
Medicines: ☐ INH, ☐ RIF ☐ _____ ☐ _____ ☐ -
_____
No. of Tabs

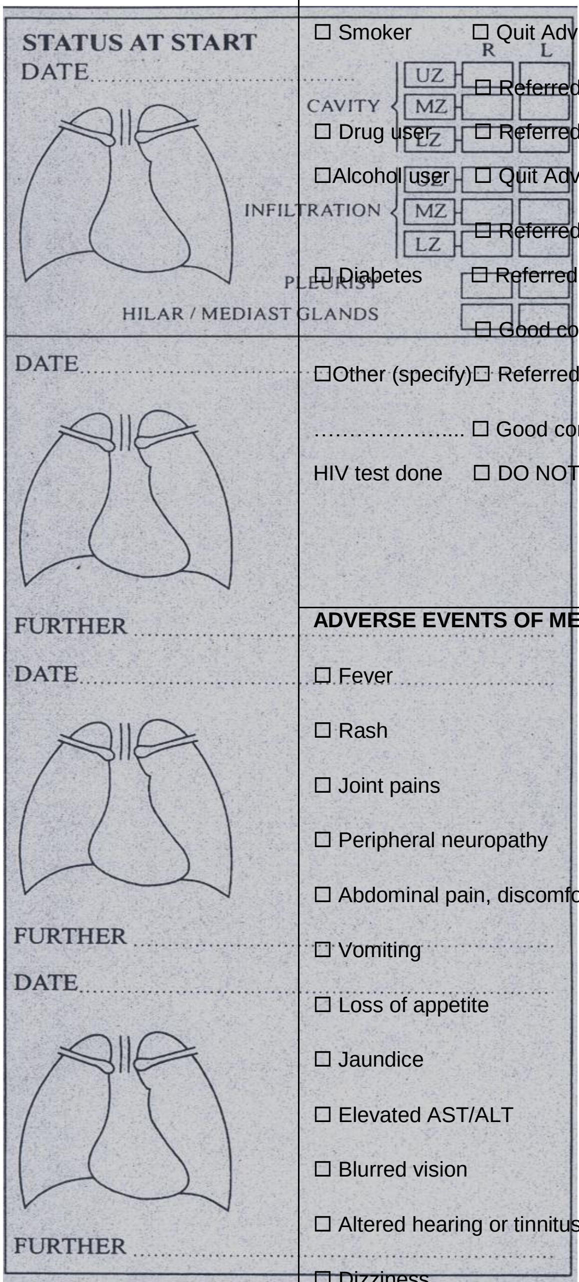
MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

TREATMENT OUTCOME:

Treatment stopped date:	D	M	Y

Outcome category	**Please tick and write date (DD/MM/YYYY)**
Cured	
Completed treatment	
Treatment Failure	
Death	
Lost to follow up	

Treatment card……………



RISK FACTORS – ACTION TAKEN

- ☐ Smoker ☐ Quit Advice Given
  - ☐ Referred for cessation
- ☐ Drug user ☐ Referred for Rx or rehab.
- ☐Alcohol user ☐ Quit Advice Given
  - ☐ Referred for cessation
- ☐ Diabetes ☐ Referred for treatment
  - ☐ Good control
- ☐Other (specify)☐ Referred for treatment
  - ………………..... ☐ Good control
- HIV test done ☐ DO NOT write result here!

ADVERSE EVENTS OF MEDICINES

- ☐ Fever
- ☐ Rash
- ☐ Joint pains
- ☐ Peripheral neuropathy
- ☐ Abdominal pain, discomfort or nausea
- ☐ Vomiting
- ☐ Loss of appetite
- ☐ Jaundice
- ☐ Elevated AST/ALT
- ☐ Blurred vision
- ☐ Altered hearing or tinnitus
- ☐ Dizziness
- ☐ Tingling or numbness around the mouth
- ☐ Bleeding tendency
- ☐ Other (specify): ……………….................

DOCTORS NOTES AND RECOMMENDATIONS

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Treatment card,,,,,,,,,

CONTACT INFORMATION FOR CONTACT TRACING

NO.	NAME	RELATIONSHIP To PATIENT	AGE	ADDRESS	CONTACT NUMBER	CONTACT TRACING ACTION	
						Completed DATE DD/MM/YY	Cannot Trace (After Repeated Attempt) DD/MM/YY

Annexe3: Case Notification form

Health Protection Agency
Republic Of Maldives
Phone: 3014494 Fax:3014484 email: ntp.maldives@gmail.com

TB Case Notification Form

This form is to be used to report newly infected TB case to Health Protection Agency

1. Name of the Facility

Name of Facility: _____ Date of Submission: _____/_____/_____
DD ***MM*** ***YYYY***

Email/Telephone Number: _____

2. Case Details

Case Classification: Suspect ☐ Probable ☐ Confirmed ☐

Full Name: _____ Permanent Address: _____
Current Address: _____ Contact No : _____
Sex: Male ☐ Female ☐ Age (Years): ____ Type of TB: Pulmonary ☐ Extra Pulmonary ☐
Site : _____
Date of Consultation: _____
Occupation: _____

4. Classification of current diagnosis (Please tick)

New ☐ Relapse ☐ Re-treatment ☐ Failure ☐

5.Treatment Category

New ☐ retreatmentI ☐ 2nd line Drugs

6. Details of Drugs (as prescribed)

7. Investigation Report

Sputum result

	Date	Result
1st Sample		
2nd Sample		
3rd Sample		

X-Ray result

Date	Findings (+/-)

Reporter Details

Name: **Designation:** **Signature:**

Instructions

- All the Health facilities should fill the first three parts of the form. This includes
  1. Name of the facility
  2. Case details
  3. Patient information
- If the case is a confirmed case the health facility should fill the entire form.
  Including the:
  4. Classification of current diagnosis
  5. Treatment Category
  6. Details of category drugs
     - Name of the drugs, dosage ,route and the duration of the treatment should be specified.
  7. Investigation Report
     - Sputum result should be written for all three samples with the date
     - If X-ray done specify the date and in the findings column write if positive(+) or Negative.
     - '***Positive***' means the X-ray has features that are compatible with pulmonary TB
     - '***Negative***' means that the X-ray has no features that are suggestive or compatible with pulmonary TB.

Annexe 4: Sputum request and reporting form

Sputum Examination Result for AFB

SPUTUM EXAMINATION RESULT FOR AFB

Name of requesting Health Centre:_____ Date: _____

Name of patient: _____ Age: _____ Sex: ☐M ☐ F

Permanent address: _____

_____

Type of TB: ☐ Pulmonary

☐ Extra-pulmonary Site: _____

Reason for examination ☐ Diagnosis

☐ Follow-up

For follow-up smears: Patient's register number _____

Laboratory Serial Number: _____

Visual appearance of sputum:	Mucopurulent	Blood-stained	Saliva
Specimen 1	☐	☐	☐
Specimen 2	☐	☐	☐
Specimen 3	☐	☐	☐

Microscopy Result (staining method: Ziehl-Neelsen)

Date	Specimen	Result*	Positive (grading)			
			3+	2+	1+	AFB#(1-9)
	A					
	B					
	C					

* Write "neg" (negative) or "pos" (positive)

1-9 AFB grading column: write the exact numbers per 100 hpf

Date: _____ Signature _____

Annexe5: National TB register

TB REGISTER FOR SPUTUM POPSITIVE PUMONARY PATIENTS

NTB NO	NAME	AGE	GENDER	TYPE (P/NP)	CLASSIFY (NEW,RELAPSE,DEFAULT,RE-TREATMENT)	PERMENANT ADDRESS		REFFERED FROM	DATE REGISTERED	STATUS	DISCHARGE DATE
						ADDRESS	ISLAND				

TB REGISTER FOR SPUTUM NEGATIVE PUMONARY /EXTRA PULMONARY PATIENTS

NTB NO	NAME	AGE	GENDER	TYPE (EP/NP)	TYPE (IF EP)	CLASSIFY (NEW,PREVIO TREATMENT)	PERMINET ADDRESS		REFFERED FROM	DATE REGISTERED	STATUS	DISCHARGE DATE
							ADDRESS	ISLAND				

NTB NO National TB Regiter Number
P Pulomonary
New
NP pulmonary
EP EXTRA- PULMONARY

Annexe6: Register for chemoprophylaxis

Chemoprophylaxis Register

ChP No:	Name	Age	Sex	INDEX case	Address	Island Address	Register Date	Status	Discharged Date

Annexe 7: TB monthly reporting form

بسم الله الرحمن الرحيم

Health Protection Agency

Republic Of Maldives

Phone: 3014494 Fax: 3014484 email: ntp.maldives@gmail.com

TB MONTHLY REPORTING FORM

Name of the Facility:……

Reporting Period:……/……/…… to ……/……/……

TB BUFFER STOCK

DRUGS/COMMODITY	STOCK RECEIVED		DURING MONTH		BALANCE
	DATE RECEIVED	EXPIRY DATE	AMOUNT USED	EXPIRY DATE	
TB KITS					
MANTOUX					

TB PATIENTS CURRENTLY ONTREATMENT

TBPATIENT No	NAME	ADDRESS	ISLAND	TREATMENT STARTED	
				DATE	FACILITY

TB PATIENTS WHO DEFAULTED

TB PATIENT NO	NAME	ADDRESS AND ISLAND	DEFAULT DATE	REASON

Report prepared by: Designation:

Date: Signature:

INSTRUCTIONS

This entire form is to be completed by the Atoll hospital with relevent information collected from the islands in the Atoll·

- TB Buffer Stock is kept in every Atoll hospital for easy access to the drugs if any patient is been diagnosed within the Atolls·
- All TB patients currently on treatment in the Atoll (including island level) should be listed in this form·
- If Any deafults are recorded in any island of the Atoll, it should be mentioned in this form with the relevent reason for the deafult·

  (For monitoring purposes in this form,**treatment outcome="default" if a patient has not taken anti-TB drugs for 3 or more consecutive days after starting treatment, or has missed receiving treatment intermittently more than 3 times for a period of 2 weeks)**

  If a patient has defaulted as in the above definitions, every effort must be taken to trace the person and continue regular treatment· If patient cannot be traced within 1 week of the date of defaulting, **please report this patient to NTP immediately** by phone and fax or email without waiting to send as monthly report·

Annexe 8. INFORMATION SHEET FOR SCREENING ACTIVE TB

NO	NAME	ADDRESS	AGE	Weight	BCG Scar	Cough > 2 wks	Fever	Weight Loss	Shortness of Breath	Lymp node Enlargement	Fatigue	Other Symptoms	Mantoux reading mm
1													
2													
3													
4													
5													
7													
8													
9													
10													
11													
12													

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World Health Organization Stop TB Partnership/ Childhood TB Subgroup.

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