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Pocket Guide for Professional Health Care Providers

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*Management  
of  
Tuberculosis (TB)*



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## ***WHAT IS TB?***

- **Tuberculosis (TB) is an infection caused by Mycobacterium Tuberculosis**
- **TB is a major public health problem in South Africa**
- **TB is transmitted through infectious droplets which are released into the air when an infectious TB patient coughs / sneezes.**
- **Pulmonary TB is the most common and most contagious**

### *Common Signs of Pulmonary TB in Adults:*

- **Persistent cough (more than 2 weeks)**
- **Sputum production – may be blood stained**
- **Shortness of breath and chest pain**
- **Loss of appetite**
- **Unexplained weight loss of more than 1.5kg a month**
- **General feeling of illness (malaise)**
- **Tiredness and loss of motivation**
- **Drenching night sweats**
- **Fever for more than two weeks**

## *Clinical Features of Pulmonary TB in Children:*

- **Decrease in weight, loss of appetite, failure to thrive without reason**
- **Cough > 2weeks, chest pain**
- **Audible wheeze: non-responsive to bronchodilators**
- **Repeated respiratory tract infections: non-responsive to treatment**
- **Painless swelling of lymph nodes commonly in the neck**
- **Fever persistent for more than 14 days without obvious cause**
- **Non specific symptoms & signs including: steady high fever, rapid pulse, vomiting, diarrhoea and cyanosis**
- **Unusual fatigue – child becomes less playful**

### *Common Symptoms & Signs of Extra-pulmonary TB (adults / Children):*

- Miliary TB: fever, night sweats, weight loss, may have enlarged liver and spleen, x-ray: diffuse small nodules, FBC: pancytopenia.
- TB meningitis: gradual onset of headache, confusion, decreased consciousness and neck stiffness.
- Tuberculous lymphadenopathy: large mediastinal lymph nodes compressing the airway resulting in an audible wheeze.
- Tuberculous Pleural effusion: chest pain, breathlessness, decreased chest movement, tracheal & mediastinal shift away from affected side.
- Tuberculous empyema: signs same as pleural effusion.
- Tuberculous Pericardial effusion: chest pain, shortness of breath, cough, dizziness, weakness, leg swelling, right hypochondrium pain, abdominal swelling.
- Peritoneal tuberculosis: ascites, palpable abdominal masses-mesenteric lymph nodes
- TB of the bones and joints: pain and swelling locally, back pain, stiff back, reluctance to bend back, sharp angular deformity of the spine. Child that refuses to walk or has paralysis or weakness of lower limbs.

## *Diagnosis of TB*

- **Individuals suspected of having TB must have examination of their sputum by smear microscopy**
- **Sputum sent to lab for microscopy**

For children < 7 years, gastric washings

For children > 7 years, sputum sent to lab for microscopy

### *It is important to note the following:*

- **There is no “trial of TB treatment”**
- **If patient has 2 negative sputum smears: provide 7 day course of broad-spectrum antibiotics and reassess.**
- **If TB is still suspected, do chest x-ray**

### *Indications for the use of Chest X Rays*

- In HIV positive patients when both smears are negative and no response to antibiotics.
- Primary TB in children.
- Where extra pulmonary TB or miliary TB is suspected.
- During or at the end of treatment where response to treatment is not satisfactory
- To help diagnose other lung diseases

## *Diagnosis of TB in HIV-positive Patients*

- No difference in clinical presentation of TB in HIV positive and HIV negative patients.
- TB can occur at any point in the course of HIV infection
- Sputum microscopy cornerstone to diagnose TB in HIV infected patients.
- HIV positive, new and retreatment cases: in cases where both smears are negative, a 3rd smear should be taken and sent to the lab for culture
- HIV positive patient with no previous TB: if the two initial smears are negative, a 3rd specimen should be sent to the lab for both smear and culture

**TB treatment is the same for HIV positive and HIV negative patients**

## *Skin Tests for TB*

- **The tuberculin skin test (TST) shows hypersensitivity to proteins of the bacillus either due to infection with M. tuberculosis or induced by vaccination with BCG.**
- **Skin tests include Tine, Monotest or Mantoux tests.**
- **The response only indicates hypersensitivity –the person has at some time been infected with M. TB or vaccinated.**
- **The skin test does not indicate the presence of TB disease.**

Mantoux test: inject PPD into layers of skin, measure reaction after 48 – 72 hours.

Tine/Mono test: press instrument into skin of forearm, measure reaction after 72 hours

## *Performing a Mantoux Skin test*

- **The tests requires:  
2 units of tuberculin protein derivative PPD-RT23 TU or  
5 units of PPD-S 5TU.**
- **Use a single dose tuberculin syringe, short 27 gauge  
needle with a short bevel to do the test.**
- **Draw up to 0.1ml of PPD of the correct strength into the  
syringe.**
- **Clean an area of skin in the mid anterior section of the arm  
and leave to dry.**
- **Inject PPD between the layers of skin (intradermally)**
- **Keep the needle almost parallel to the skin, injection goes  
into and not under the skin.**
- **A small papule should form at the injection site.**
- **Measure the reaction in 48-72 hours.**
- **Measure the widest transverse point across the edges of  
the raised thickened area.**
- **The area of induration is measured NOT the redness.**
- **Record the results in millimeters.**

## *Reading the Tuberculin Skin Test*

Immune Status	HIV positive, malnourished, severe illness	Others (including previous BCG)
Diameter of induration in positive test	≥ 5mm	≥10mm

## *Tuberculin Skin Test Interpretation*

### **What does a positive tuberculin skin test mean?**

Indicates TB infection, but not necessarily TB disease

- Child < 5 years, or an HIV infected child with a positive skin test indicates recent infection: risk for progression to disease
- Use the tuberculin test in conjunction with clinical features, x-ray results and history of contact

Children under 5 years, HIV infected children of any age and HIV infected adults with a positive skin test and no symptoms of TB should be put on TB prophylaxis for six months (Isoniazid Prophylaxis)

### **What does a negative tuberculin skin test mean?**

1. Does not exclude TB
2. A negative reaction even if a child has TB can be due to the following:
  - HIV infection
  - Malnutrition
  - Severe viral infections (measles, chickenpox)
  - Cancer and treatment for cancer
  - Immunosuppressive drugs (steroids)
  - Severe disseminated TB

### *Important things to do in a child diagnosed with TB*

- Exclude HIV infection
- Refer HIV-infected children to the local HIV clinic
- Consider referral for nutritional support
- Complete the TB Register
- Make a note in the Road to Health Card.
- Ask about other children or adults in the household and screen them for TB

## *Sputum Collection:*

All individuals suspected of having TB should have 2 specimens examined for bacteriological confirmation of disease (TB smear microscopy)

### **A. First specimen:**

- Taken at first visit – spot or “immediate” specimen

### **B. Second specimen:**

- Patient takes sputum container home – gets early morning specimen next day
- The jar should be brought back on the day the specimen is collected

**OR**

- Let patient wait at clinic for at least 1 hour and take second sample

## **PROCEDURE**

### *Sputum Collection*

- Supervise collection BUT do not stand in front of person!
- Perform procedure in well ventilated area, without others watching
- Let person rinse mouth with water
- Ask patient to direct sputum into container without contaminating outside of container
- Give patient container without the lid
- Hold lid yourself
- Demonstrate deep cough from bottom of chest
- Encourage person to produce specimen after deep coughing
- Replace lid immediately
- Secure lid press on centre till click is heard
- Wash hands after collection
- Record the patient's details and the date specimen was collected in the case identification and follow up register

## *Storage & Transport of Sputum Specimens*

- Put sputum bottle in plastic bag to prevent contamination
- Send away to laboratory as soon as possible
- Store in refrigerator if transport is not available immediately (do not freeze!)
- Transport in cooler bag
- Ensure that specimens are not exposed to direct sunlight

## *TB Treatment: New Adult Cases Regimen 1*

Pre treatment body weight	Intensive Phase 7 days a week for 2 months	Continuation phase 7 days a week for 4 months	
	RHZE (150,75,400,275)	RH (150,75)	RH (300,150)
30-37 kg	2 tabs	2 tabs	-
38-54 kg	3 tabs	3 tabs	-
55-70 kg	4 tabs		2 tabs
> 71 kg	5 tabs		2 tabs

R Rifampicin, H Isoniazid, Z Pyrazinamide, E Ethambutol  
 Directly Observed Treatment (DOT) is recommended for the entire period of treatment

## ***Monitoring Progress: Adult Pulmonary TB (New Smear Positive Patients)***

In uncomplicated cases, TB treatment is given every day for a period of 6 months:

*Response to treatment should be monitored by sputum smear examination at 2 and 5 months.*

### **A. Sputum microscopy:**

*should be done one week before end of the 2 months intensive phase of treatment to evaluate smear conversion:*

Send 2 sputum samples for TB microscopy

- If both smears are **negative at 2 months:**
  - begin continuation phase of TB treatment
- If one or both smears are **positive at 2 months:**
  - Prolong the intensive phase of TB treatment for one month
  - Perform sputum culture and drug susceptibility tests (DST)

Positive smears at 2 months may indicate:

- Poorly supervised initial phase of therapy
- Patient non adherence
- Slow rate of progress with smear conversion
- Patient may have drug resistant TB
- Mycobacterium other than TB (MOTTs) also termed non

## *Monitoring Progress: Adult Pulmonary TB (New Smear Positive Patients)*

Patients in whom the continuation phase has been extended for a 3rd month:

- 2 sputum samples should be repeated at the end of 3 months
- If sputum samples are still positive at the end of 3 months, TB culture & DST should be done
- If either the 2 or 3 month sputum sample reveals MDR-TB, record patient as a treatment failure and refer patient to MDR TB clinic urgently.

### ***B. Sputum investigation at 5 months:***

- Send 2 sputum samples for TB microscopy
- If both sputum samples are **negative** and patient is clinically well:
  - continue treatment until 6 months & record patient as cured
- If one or both sputum samples are **positive**:
  - register patient as a treatment failure, send sputum for TB culture & DST, re-register patient as re-treatment patient & start re-treatment regimen. If MDR-TB refer to an MDR-TB unit.

## *TB Treatment: Retreatment Cases Regimen 2*

Pre-treatment body weight	Intensive Phase RHZE 7 days a week & streptomycin 5 days a week for 2 months.		Intensive Phase 7 days a week for 1 month	Continuation phase 7 days a week for 5 months			
	RHZE (150,75, 400,275)	*Streptomycin (g)	RHZE (150,75,400,275)	RH (150,75)	E (400)	RH (300,150)	E (400)
30-37 kg	2 tabs	0.5	2 tabs	2 tabs	2 tabs		
38-54 kg	3 tabs	0.75	3 tabs	3 tabs	2 tabs		
55-70 kg	4 tabs	1.0	4 tabs			2 tabs	3 tabs
>71 kg	5 tabs	1.0	5 tabs			2 tabs	3 tabs

R Rifampicin, H Isoniazid, Z Pyrazinamide, E Ethambutol

\*\*Streptomycin should NOT be given during pregnancy and to those over 65 years.  
Directly Observed Treatment (DOT) is recommended for the entire period of treatment

## *Monitoring Progress: Adult Pulmonary TB (Re-treatment Patients)*

### A. Sputum investigations at 3 months:

- Send 2 sputum samples for TB microscopy one week before the end of 3 months to evaluate smear conversion.
- If both sputum samples are negative: start continuation phase of TB re treatment regimen
- If one or both samples are positive: send sputum for TB culture & DST and continue with intensive phase TB treatment for another month.
- If sensitive, start continuation phase and repeat smears at the end of the 4th month
- If resistant to two (RH) or three drugs (RHE) record as MDR TB and refer to MDR TB unit

### B. Sputum investigations at 7 months:

- Send 2 sputum samples, 1 for TB microscopy and 1 for smear and culture
- If both sputum samples are negative for smear and culture: continue treatment until 8 months and record patient as cured
- If patient shown susceptibility to first line drugs and sputum smear or culture is positive at 7 months register patient as treatment failure and refer to medical officer

## *Treatment Of Children with uncomplicated TB: Regimen 3*

<i>Body weight</i>	<i>Intensive phase (2 months) DOT given 7 days a week  RHZ 60/30/150mg tablet</i>	<i>Continuation Phase (4 months) DOT given 7 days a week  RH 60/30mg tablet</i>
2 2.9 kg	½ tablet	½ tablet
3 5.9 kg	1 tablet	1 tablet
6 8.9 kg	1½ tablet	1½ tablet
9 11.9 kg	2 tablets	2 tablets
12 14.9 kg	2½ tablets	2½ tablets
15 19.9kg	3 tablets	3 tablets
20 24.9kg	4 tablets	4 tablets
25 29.9kg	5 tablets	5 tablets
30 35kg	6 tablets	6 tablets

## *Monitoring response to TB Treatment in Children*

- Growth:
  - Child gains weight
- Symptomatic:
  - TB symptoms disappear
  - Fever may take 2 or more weeks to subside
- Radiological:
  - CXR - may remain unchanged for 18 months or longer, despite satisfactory response to treatment (especially hilar and mediastinal lymphadenopathy).

## *Care of Babies Born to Mothers with Active PTB*

- Need to ensure that mother is on correct PTB treatment and is fully compliant.
- Establish that mother has good knowledge of cough hygiene & infection control practices
- Baby should not receive BCG at birth
- If baby is **symptomatic**:
  - evaluate fully to exclude TB
  - If baby has TB should receive full course of TB treatment
- If baby is **asymptomatic**:
  - Give preventive therapy, (isoniazid 5mg/kg/day) for 6 months
  - Baby should NOT initially receive BCG vaccination
  - If baby continues to be asymptomatic, BCG is administered after completion of preventive treatment (after 6 months)

## *TB Drugs: Minor Side Effects & Their Management*

Side Effects	TB drug	Management of side effect
Anorexia, nausea, abdominal pain	Rifampicin	Continue treatment, advise patient to take TB treatment last thing at night
Discoloration of urine / tears (orange / red colour)	Rifampicin	Reassure patient Continue TB drugs
Joint pain	Pyrazinamide	Aspirin 300mg daily Continue TB drugs
Burning sensation in feet	Isoniazid	Pyridoxine 25 mg daily Continue TB drugs

**Note: Remember to warn patient that Rifampicin colours urine, sweat and tears pink. Urine looks orange-pink**

## *TB Drugs: Major Side Effects & Their Management*

Side Effects	TB drug	Management of side effect
Severe skin itching, rash, anaphylactic reaction	Streptomycin	Stop streptomycin. Treat as hypersensitivity reaction and refer
Deafness	Streptomycin	Stop streptomycin
Dizziness (vertigo and nystagmus)	Streptomycin	Stop streptomycin if severe
Jaundice (other causes excluded)	Most anti- TB drugs	Stop anti TB drugs until jaundice resolves, then introduce one by one. Refer patient
Vomiting & confusion	Most anti-TB drugs	Stop anti- TB drugs, urgent liver function tests
Visual impairment	Ethambutol	Stop Ethambutol
Generalised reaction: shock & purpura	Rifampicin	Stop Rifampicin

**NB: Rifampicin reduces the efficacy of both oral and injectable contraceptives. Dose of contraceptives should be increased. Depo provera 150mg should be given 8 weekly instead of 12 weekly. Nur-isterate 200mg should be given 6 weekly instead of 8 weekly. Intra Uterine Contraceptive Devices (IUCD) recommended. Combine oral contraceptives with at least 0.05mg ethinyloestradiol**

## *Association between TB and HIV*

- All TB patients must be screened for HIV
- HIV weakens the immune system
- TB and HIV form a lethal combination, speeding each others progress
- Untreated TB is the leading cause of death among HIV positive people

## *When To Suspect Multi-drug Resistant TB (MDR-TB)*

MDR-TB should be suspected in the following categories of TB patients:

### **New PTB patients:**

- Sputum smear or culture positive at 2 months and no clinical improvement
- Intensive phase extended for the 3rd month and sputum smear and culture still positive
- Sputum smears were negative at 2 months but positive at 5 months

### **Retreatment TB clients**

- Sputum smear and culture remains positive at 3 months of intensive therapy
- Sputum smear and culture was negative at 3 months but becomes positive at 7 months

### **Contacts of MDR-TB patients**

### **All TB treatment failures and interruption cases**

## *Continuum of Care for TB Patients*

Providing an appropriate continuum of care for all TB patients includes:

- Directly Observed Treatment (DOTS) & treatment adherence counselling
- Intensive TB Treatment using appropriate treatment regimens
- Provide HIV Counseling & Testing to ALL TB patients
- Identification/Screening for opportunistic / other infections
- Follow-up testing (2 month sputum for smear conversion)
- Follow-up testing (5 month sputum for treatment outcomes)
- Treatment Completion
- Psychosocial support & reassurance

## *Health Information for TB Patients:*

- **Important to establish - TB CAN BE CURED EVEN IF HIV POSITIVE**
- Importance of compliance and completion of treatment
- Refer to DOTS worker (Direct observed treatment support)
- Motivate for VCT (voluntary counseling and testing)
- Importance of return to health facilities for all sputum tests
- Nutritional information
- Counsel family for support