

# South African National TB Guidelines - Children

## DIAGNOSIS OF PULMONARY TUBERCULOSIS (PTB) IN CHILDREN

Diagnosis of TB in children is based on a combination of clinical presentation, history of exposure, bacteriology, chest x-ray and tuberculin skin test (Mantoux®)

Clinical (The presence of at least three of these features is suggestive of TB)	<ul style="list-style-type: none"> <li>≥ 2 week history of cough or wheeze</li> <li>Persistent fever</li> <li>Weight loss</li> <li>Unusual fatigue</li> <li>Physical signs suggestive of TB e.g. enlarged lymph glands and night sweats</li> <li>Chest x-ray suggestive of TB</li> </ul>
Bacteriological	<ul style="list-style-type: none"> <li>Positive GeneXpert, smear microscopy, culture and drug sensitivity testing or line probe assay (LPA)</li> </ul>

## TB CATEGORIES

Uncomplicated TB in children < 8 yrs or < 30 kg	Low bacillary load TB such as PTB with minimal lung parenchyma involvement, intrathoracic disease (mediastinal/hilar lymph node involvement), TB lymphadenitis and TB pleural effusion	Refer to treatment <b>Table A</b>
Complicated TB in children < 8 yrs or < 30 kg	Severe forms of TB such as TB pericarditis, abdominal TB, osteo-articular TB, and high bacillary PTB (smear positive disease, extensive parenchymal involvement on chest x-ray, cavities on chest x-ray), TB with HIV co-infection	Refer to treatment <b>Table B</b>
TB Meningitis or Miliary TB in children	Serious forms of TB with brain/meningeal involvement	Refer to treatment <b>Table C</b>
Uncomplicated or complicated TB in children > 8 years and > 30 kg		Refer to treatment <b>Table D</b>

## TREATMENT TABLE A (REGIMEN 3A)

### TREATMENT OF UNCOMPLICATED TB DISEASE IN CHILDREN < 8 YEARS OR < 30 KG

Treatment phase	Intensive phase - 7 days a week for 2 months			Continuation phase - 7 days a week for 4 months
Formulation/Body weight	Rifampicin (R)/Isoniazid (H) 60 mg/60 mg	Pyrazinamide (Z) 150 mg tablet or 150 mg/3 ml	OR Pyrazinamide (Z) 500 mg	Rifampicin (R)/Isoniazid (H) 60 mg/60 mg
2- 2.9 kg	½ tablet	1.5 ml* (75 mg)		½ tablet
3-3.9 kg	¾ tablet	2.5 ml* (125 mg) or	¾ tablet (125 mg)	¾ tablet
4-5.9 kg	1 tablet	3 ml* (150 mg) or	¾ tablet (125 mg)	1 tablet
6-7.9 kg	1 ½ tablets		½ tablet (250 mg)	1 ½ tablets
8-11.9 kg	2 tablets		½ tablet (250 mg)	2 tablets
12-14.9 kg	3 tablets		1 tablet (500 mg)	3 tablets
15-19.9 kg	3 ½ tablets		1 tablet (500 mg)	3 ½ tablets
20-24.9 kg	4 ½ tablets		1 ½ tablets (750 mg)	4 ½ tablets
25-29.9 kg	5 tablets		2 tablets (1000 mg)	5 tablets

**Target dose or range (mg/kg/dose):** R: 10-20 mg/kg/day (max 600); H: 10-15 mg/kg/day (max 300); Z: 30-40 mg/kg/day (max 2 g)

## \*HOW TO MAKE PAEDIATRIC PYRAZINAMIDE AND ETHAMBUTOL SOLUTIONS

<b>Pyrazinamide 150 mg/3 ml solution</b> <b>150 mg tablet available:</b> For each dose, dissolve 150 mg dispersible (1 tablet) in 3 mL of water to prepare a concentration of 50 mg/mL (150 mg/3 mL)	<b>500 mg tablet available:</b> For each dose, crush 500 mg (1 tablet) to a fine powder and dissolve in 10 ml of water to prepare a concentration of 50 mg/ml (150 mg/3 ml)
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- Use either tablet strength at any one time depending on availability but NOT both
- Discard any unused solution, and prepare a fresh solution for each dose

### Ethambutol 400 mg/8 ml solution

- For each dose, crush 400 mg (1 tablet) to a fine powder and dissolve in 8 ml of water to prepare a concentration of 400 mg/8 ml
- Discard any unused solution and prepare a fresh solution each time

## TREATMENT TABLE B (REGIMEN 3B)

### TREATMENT OF COMPLICATED TB DISEASE IN CHILDREN < 8 YRS OR < 30 KG (EXCLUDING TB MENINGITIS AND MILIARY TB)

Treatment Phase	Intensive phase - 7 days a week for 2 months					Continuation phase - 7 days a week for 4 months <sup>#</sup>
Formulation/Body weight	Rifampicin (R)/Isoniazid (H) 60 mg/60 mg	Pyrazinamide (Z) 150 mg tablet or 150 mg/3 ml	OR Pyrazinamide (Z) 500 mg	Ethambutol (E) 400 mg or 400 mg/8 ml	Rifampicin (R)/Isoniazid (H) 60 mg/60 mg	
2-2.9 kg	½ tablet	1.5 ml* (75 mg)		1 ml* (50 mg)	½ tablet	
3-3.9 kg	¾ tablet	2.5 ml* (125 mg) or	¾ tablet (125 mg)	1.5 ml* (75 mg)	¾ tablet	
4-5.9 kg	1 tablet	3 ml* (150 mg) or	¾ tablet (125 mg)	2 ml* (100 mg)	1 tablet	
6-7.9 kg	1 ½ tablets		½ tablet (250 mg)	3 ml* (150 mg)	1 ½ tablets	
8-11.9 kg	2 tablets		½ tablet (250 mg)	½ tablet (200 mg)	2 tablets	
12-14.9 kg	3 tablets		1 tablet (500 mg)	¾ tablet (300 mg)	3 tablets	
15-19.9 kg	3 ½ tablets		1 tablet (500 mg)	1 tablet (400 mg)	3 ½ tablets	
20-24.9 kg	4 ½ tablets		1 ½ tablets (750 mg)	1 tablet (400 mg)	4 ½ tablets	
25-29.9 kg	5 tablets		2 tablets (1000 mg)	1 ½ tablets (600 mg)	5 tablets	

**Target dose or range (mg/kg/dose):** R: 10 - 20 mg/kg/day (max 600); H: 10-15 mg/kg/day (max 300); Z: 30-40 mg/kg/day (max 2 g); E: 15-25 mg/kg/day (max 1200 mg)

<sup>#</sup>Extend the continuation phase to up to 8 months for patients with osteo-articular TB

## TREATMENT TABLE C

### TREATMENT OF TB MENINGITIS AND MILIARY TB IN CHILDREN

Drug	Duration*	Dosage	Maximum daily dose
Rifampicin	6 months	20 mg/kg as a single daily dose	600 mg (some experts will go up to 900 mg)
Isoniazid	6 months	20 mg/kg as a single daily dose	400 mg
Pyrazinamide	6 months	40 mg/kg as a single daily dose	2000 mg
Ethionamide	6 months	20 mg/kg as a single daily dose	1000 mg (adverse effects may restrict dosing to up to 750 mg)

\*If concerned about ongoing disease, extend treatment duration by 3 months (total treatment duration: 9 months). Consult a specialist

## TREATMENT TABLE D

### TREATMENT OF UNCOMPLICATED OR COMPLICATED TB IN CHILDREN > 8 YEARS AND > 30 KG

Body weight	Initial phase - 7 days a week for 2 months	Continuation phase - 7 days a week for 4 months	
	Rifampicin, isoniazid, pyrazinamide, ethambutol (150/75/400/275)	Rifampicin, isoniazid (150/75)	Rifampicin, isoniazid (300/150)
30-37 kg	2 tablets	2 tablets	
38-54 kg	3 tablets	3 tablets	
55-70 kg	4 tablets		2 tablets
>71 kg	5 tablets		2 tablets

## PYRIDOXINE PROPHYLAXIS

- For all malnourished or HIV-positive children: pyridoxine 12.5 mg daily for children < 5 years and pyridoxine 25 mg/day for children > 5 years

## MONITORING RESPONSE TO TREATMENT

Type of Monitoring	Frequency of Monitoring	Monitoring Parameters
Clinical	Monthly for first 2 months, thereafter every 2 months until completion of TB treatment	<ul style="list-style-type: none"> <li>Presence of TB symptoms</li> <li>Treatment adherence - review the patient treatment card (Green card), conduct pill count</li> <li>Adverse events</li> <li>Weight gain - measure and record the patient's weight</li> <li>Review medication dosages and adjust according to weight</li> </ul>
Bacteriological	At 7 weeks (end of intensive phase) At 23 weeks (end of continuation phase)	<ul style="list-style-type: none"> <li>Smear microscopy (where appropriate)</li> <li>TB culture</li> <li>If TB culture is positive, do drug susceptibility testing</li> </ul>

If poor response to treatment, check for the following: non-adherence to treatment, resistance, other lung diseases etc.

## TREATMENT OF TB IN HIV CO-INFECTED CHILDREN

TB Develops While on Antiretroviral Therapy (ART):	TB Diagnosed Before Starting ART:
ART should be continued throughout TB treatment  <b>On efavirenz-based regimen:</b> <ul style="list-style-type: none"> <li>No dosage adjustment required</li> </ul> <b>On nevirapine-based regimen:</b> <ul style="list-style-type: none"> <li>Consult with an expert or hotline</li> </ul> <b>On lopinavir/ritonavir-based regimen</b> <ul style="list-style-type: none"> <li>Provide additional ritonavir while on rifampicin-containing treatment</li> <li>Ritonavir should be added at a dose of 0.75 times the volume of the lopinavir/ritonavir dose. This should be continued for at least 2 weeks after completion of TB treatment. Check ART dosing chart</li> <li>TB treatment should be started at standard doses</li> <li>In older children the dose of lopinavir/ritonavir should be doubled as in adults</li> </ul>	<b>Fast-track ART in the following patients (start within two weeks after starting TB treatment):</b> <ul style="list-style-type: none"> <li>Patients under 5 yrs with a CD4 percentage &lt; 15%</li> <li>Patients over 5 yrs with CD4 cell count &lt; 50</li> <li>Patients with drug resistant TB</li> </ul> <b>Start ART within 2-8 weeks after starting TB treatment:</b> <ul style="list-style-type: none"> <li>Patients under 5 yrs with a CD4 percentage &gt; 15%</li> <li>Patients over 5 yrs with CD4 cell count &gt; 50</li> </ul> <b>Defer ART until eight weeks after starting TB treatment in patients with TB meningitis (irrespective of CD4 count)</b>

## MANAGEMENT OF COMMON ADVERSE DRUG REACTIONS

Adverse Drug Reaction	Drug Involved	Management
Peripheral neuropathy	Isoniazid	Pyridoxine - for prophylaxis, or treatment once isoniazid toxicity occurs
Hepatitis or jaundice	Rifampicin, isoniazid, pyrazinamide	Stop all drugs. Exclude other causes. Commence at least three antituberculosis drugs with low/no hepatotoxic potential as background therapy. Rechallenge TB treatment in hospital
Gastrointestinal disturbances	Rifampicin, isoniazid, pyrazinamide, ethambutol	Symptomatic treatment
Skin rash	Rifampicin, isoniazid, pyrazinamide, ethionamide	Mild: Symptomatic treatment Severe (skin rash with blistering, mucosal involvement, systemic symptoms): stop all drugs Once resolved, rechallenge TB drugs in hospital
Loss of colour vision	Ethambutol	Stop ethambutol and refer to eye specialist same day
Joint pain	Pyrazinamide	Give paracetamol 15 mg/kg (up to 1 g) 6 hourly as needed up to 5 days

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**NEED HELP?**

Contact the TOLL-FREE National HIV & TB Health Care Worker Hotline

0800 212 506/021 406 6782 Alternatively send an SMS or "Please Call Me" to 0718401572  
[www.mic.uct.ac.za](http://www.mic.uct.ac.za)



Based on the National Guidelines for the Management of Tuberculosis in Children 2013, Department of Health, South Africa.