2025

MANAGEMENT OF TUBERCULOSIS IN CHILDREN AND ADOLESCENTS

(0 - <15 years old)

A QUICK REFERENCE GUIDE

for frontline healthcare providers on the prevention (TPT), diagnosis and treatment of drug-susceptible TB (DS-TB) and rifampicin-resistant TB (RR-TB) in children and adolescents in South Africa.

health
Department:
Health
REPUBLIC OF SOUTH AFRICA

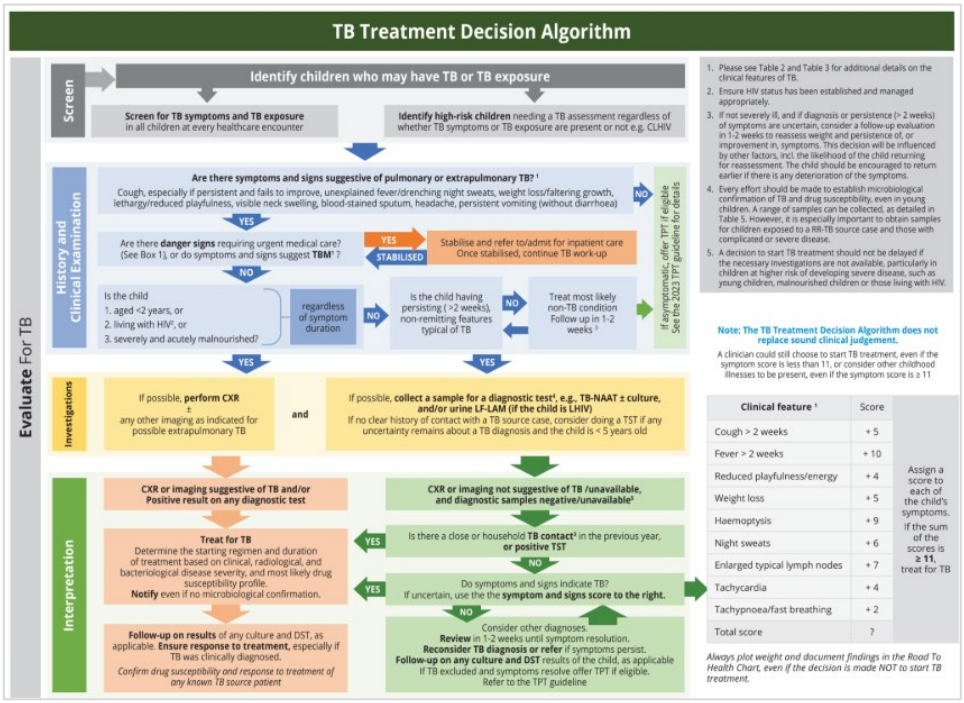
Gates Foundation

THINKTANK

2030 NDP

About this Quick Reference 'How to' Guide

This quick reference guide has been designed to supply all the definitions and basic 'how to' tools to support frontline health workers to navigate through a TB consultation with a child or adolescent.
The guide starts by summarising the latest policy updates in a table for quick review.
The rest of the guide is centred on ensuring frontline health workers are competently able to navigate through the main "TB Treatment Decision Algorithm" from the 2024 NDOH Management of Tuberculosis in Children and Adolescents. Using 'how to' boxes, this guide explains and supports the health worker to navigate each step of the pathway.



This tool integrates information and dosing tables for children and adolescents for:

- Treatment of TB infection with TB Preventive Treatment (TPT)
- Diagnosis and treatment of drug-susceptible TB (DS-TB) – including the new shortened TB regimens for children
- Diagnosis and treatment of rifampicin-resistant TB (RR-TB)
- Management of TB infection in the newborn, including BCG vaccinations

- Relevant aspects of IMCI care have also been incorporated and cross-referenced.

Step-by-step guidance is provided on how to assess chest x-rays and perform procedures necessary for TB investigations in children and includes:

- How to assess a paediatric chest x-ray for TB
- How to collect sputum from a child
  - » How to perform an induced sputum
  - » How to perform a gastric aspirate
- How to perform a urine LF-LAM
- How to collect a stool sample
- How to perform a TST

The following guides have been referenced for this guide:

2019 NDOH Management of Rifampicin-Resistant TB guidelines
2023 NDOH Clinical Management of Rifampicin-Resistant Tuberculosis Clinical Reference Guide
2023 NDOH Guidelines on the Treatment of Tuberculosis Infection
2024 NDOH Clinical Guideline for the Diagnosis and Treatment of DS-TB in Children and Adolescents in SA

2025 WHO consolidated guidelines on tuberculosis. Module 4: treatment and care. Geneva: World Health Organization;2025. Licence: CC BY-NC-SA 3.0 IGO)

Contents

This guide is available online for download:

Click on the link here or scan the QR code:

What are the main updates?

WHAT ARE THE MAIN UPDATES		
Use a 'TB Test and treat' approach: Assess and offer either TB infection treatment (TPT) or TB disease treatment (using new shortened regimens, where eligible).		
TPT		
New	**Old**	**Explanation**
All persons who • Have had a significant TB exposure or, • Have a high risk of TB disease progression are eligible for TPT.	Only children < 5 years old and PLHIV.	To achieve TB elimination, it is imperative to scale up and implement TPT more comprehensively.
Before starting TPT: • In well children without symptoms, neither sputum testing nor chest x-ray (CXR) are requirements to start TPT. • Similarly, TST (Mantoux) and IGRA tests are not a requirement for starting TPT (i.e. they are not needed).	-	A positive test for TB infection means that the person is (or was previously) infected with M.tb but not that it is causing active TB disease. Also, a negative test of TB infection does not mean that the person is not actually infected with M.tb or is not at risk for developing TB disease in the near future. Therefore, tests for TB infection are not a requirement to initiate TPT.
A new shortened TPT regimen for eligible children > 25 kg is available – 3HP: 3 months of once weekly rifapentine and isoniazid. (Eligibility: HIV negative children or CLHIV already on ART (TLD) with a suppressed VL < 50 in past 3 months). 3RH and 4R included	Only 6H | 12H used previously	The use of shorter duration TPT regimens has been shown to reduce the burden of TPT treatment on individuals, households and on health services.
Timing of BCG vaccination has been revised: 1. All healthy newborn infants being discharged home are to receive BCG at discharge, regardless of HIV status or TB exposure status. 2. BCG should be repeated in the well child once TB medication is completed (TPT or TB treatment).	BCG vaccination was deferred in newborns with TB exposure and needing to start TPT. BCG was delayed until after TPT completion as TB drugs impair the effect of live BCG (*M.bovis* BCG) vaccine.	This updated policy is based on operational considerations – often there are many health workers making decisions about different aspects of care. This recommendation has been made to ensure newborns do not miss their BCG vaccination. Timing of BCG vaccination for infants newly diagnosed with HIV who are not exposed to TB has not changed – they are only eligible for TPT after 14 weeks of age.

WHAT ARE THE MAIN UPDATES- CONTINUED

DS-TB

New	Old	Explanation
New shortened 4-month TB regimen for eligible children.	At least 6 months of TB treatment for all children.	The SHINE TB-Trial (Shorter Treatment for Minimal Tuberculosis in Children) showed a new shorter 4-month TB treatment regimen is as effective and safe as the standard 6-month regimen for children with non-severe, smear negative DS-TB.
New terminology: TB disease is now categorised as "Non-severe TB" or "Severe TB" according to several criteria.	TB previously categorised as "Regimen 3A Uncomplicated" and "Regimen 3B Complicated."	Disease severity informs treatment shortening decisions.
Ethambutol is back for everyone! Ethambutol (or ethionamide) has been re-introduced into the 2-month intensive phase for all children (severe and non-severe).	In previous guidelines, ethambutol (ETH) was only indicated for children > 8 years, complicated TB (such as EPTB). It was not used in uncomplicated disease in young children due to fear of optic adverse events and difficulty assessing visual acuity.	± 70% of the children in the SHINE trial received ethambutol. Side effects of ETH are dose-related and safe doses have now been included in the standard regimens.
Age range for DS-TB treatment dosing charts and treatment shortening criteria has been updated to < 15 years old.	0-14 year old threshold was used in previous 2013 guidelines. DS-TB treatment dosing charts from 2024 Childhood TB guidelines included 15 year olds.	To align recommendations for specific age groups with standard implementation and reporting norms.

RR-TB

New	Old	Explanation
New terminology: Standardised vs individualised	Previously known as "short" vs "long"	-
All ages can access all medicines, except Pretomanid. Bedaquiline and Delamanid now advised for all ages	Previously Delamanid and bedaquiline were not used in young children.	-
Length of treatment regimens are new: • 6 months for non-severe RR-TB • 9-12 months for severe	Previously regimens were 9-18 months	
Children aged < 15 years should be offered RR-TB treatment according to the current algorithm (Figure 3.1) outlined in Section 3 of the 2023 RR-TB Guidelines. Children treated for FLQ-susceptible RR-TB should be offered delamanid as the preferred choice over terizidone. Terizidone included as first choice		

Section 1

Tools to understand and navigate a TB consultation

TB treatment decision algorithm for children < 10 years old

Note: for adolescents (10 years and older), refer to adult screening and diagnostic algorithms.

Evaluate For TB

Screen

Screen for TB symptoms and TB exposure in all children at every healthcare encounter

Identify high-risk children needing a TB assessment regardless of whether TB symptoms or TB exposure are present or not e.g. CLHIV

History and Clinical Examination

Are there symptoms and signs suggestive of pulmonary or extrapulmonary TB? [1]

Cough, especially if persistent and fails to improve, unexplained fever/drenching night sweats, weight loss/faltering growth, lethargy/reduced playfulness, visible neck swelling, blood-stained sputum, headache, persistent vomiting (without diarrhoea)

NO → If asymptomatic, offer TPT if eligible See the 2023 TPT guideline for details

YES

Are there **danger signs** requiring urgent medical care? (See Box 1), or do symptoms and signs suggest **TBM**[1] ?

YES → Stabilise and refer to/admit for inpatient care

STABILISED → Once stabilised, continue TB work-up

NO

Is the child
1. aged <2 years, or
2. living with HIV[2], or
3. severely and acutely malnourished?

regardless of symptom duration

NO → Is the child having persisting (>2 weeks), non-remitting features typical of TB

NO → Treat most likely non-TB condition Follow up in 1-2 weeks [3]

YES

YES

Investigations

If possible, **perform CXR** ± any other imaging as indicated for possible extrapulmonary TB

and

If possible, **collect a sample for a diagnostic test**[4], **e.g., TB-NAAT ± culture, and/or urine LF-LAM (if the child is LHIV)**
If no clear history of contact with a TB source case, consider doing a TST if any uncertainty remains about a TB diagnosis and the child is < 5 years old

Interpretation

CXR or imaging suggestive of TB and/or Positive result on any diagnostic test

Treat for TB
Determine the starting regimen and duration of treatment based on clinical, radiological, and bacteriological disease severity, and most likely drug susceptibility profile.
Notify even if no microbiological confirmation.

Follow-up on results of any culture and DST, as applicable. **Ensure response to treatment,** especially if TB was clinically diagnosed.
Confirm drug susceptibility and response to treatment of any known TB source patient

CXR or imaging not suggestive of TB /unavailable, and diagnostic samples negative/unavailable[5]

Is there a close or household **TB contact**[3] in the previous year, **or positive TST**

YES

NO

Do symptoms and signs indicate TB?
If uncertain, use the the **symptom and signs score to the right.**

YES

NO

Consider other diagnoses.
Review in 1-2 weeks until symptom resolution.
Reconsider TB diagnosis or refer if symptoms persist.
Follow-up on any culture and DST results of the child, as applicable
If TB excluded and symptoms resolve offer TPT if eligible.
Refer to the TPT guideline

1. Please see Table 2 and Table 3 for additional details on the clinical features of TB.
2. Ensure HIV status has been established and managed appropriately.
3. If not severely ill, and if diagnosis or persistence (> 2 weeks) of symptoms are uncertain, consider a follow-up evaluation in 1-2 weeks to reassess weight and persistence of, or improvement in, symptoms. This decision will be influenced by other factors, incl. the likelihood of the child returning for reassessment. The child should be encouraged to return earlier if there is any deterioration of the symptoms.
4. Every effort should be made to establish microbiological confirmation of TB and drug susceptibility, even in young children. A range of samples can be collected, as detailed in Table 5. However, it is especially important to obtain samples for children exposed to a RR-TB source case and those with complicated or severe disease.
5. A decision to start TB treatment should not be delayed if the necessary investigations are not available, particularly in children at higher risk of developing severe disease, such as young children, malnourished children or those living with HIV.

Note: The TB Treatment Decision Algorithm does not replace sound clinical judgement.

A clinician could still choose to start TB treatment, even if the symptom score is less than 11, or consider other childhood illnesses to be present, even if the symptom score is ≥ 11

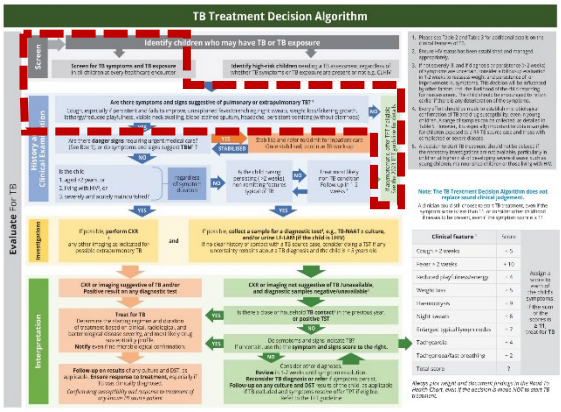
Clinical feature [1]	Score
Cough > 2 weeks	+ 5
Fever > 2 weeks	+ 10
Reduced playfulness/energy	+ 4
Weight loss	+ 5
Haemoptysis	+ 9
Night sweats	+ 6
Enlarged typical lymph nodes	+ 7
Tachycardia	+ 4
Tachypnoea/fast breathing	+ 2
Total score	?

Assign a score to each of the child's symptoms. If the sum of the scores is **≥ 11**, treat for TB

Always plot weight and document findings in the Road To Health Chart, even if the decision is made NOT to start TB treatment.

SCREEN FOR TB INFECTION AND TB DISEASE

USE THE ALGORITHM FROM p8 TO GUIDE A TB CONSULTATION WITH A CHILD.
Use these pages for explanations of how to perform each step of the algorithm.
The red box shows which part of the algorithm the page explains.



How to screen for TB symptoms:

Ask if the child has any of these symptoms...

'Persistent': generally, refers to 2 weeks or longer.

How to screen for significant TB exposure:

Do you think the child has had a TB contact?
For example, in the last 12 months, has the child been in contact with an adult or adolescent with TB or who you think might have TB* (coughing, losing weight)?"

No → Consider this **no known significant TB exposure.**

Yes
Was the person infectious at the time?
For example, a person is considered infectious if they had TB of the lungs and the exposure was during the 3 months before they started treatment.

No → Consider this **no known significant TB exposure.**

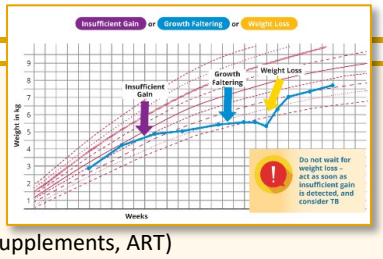
Yes or unsure
Did the child spend some time in close contact with the person?
For example, did the child sleep in the same room, or spend long periods during the day with this person (like at school or crèche or on transport to school or with visitors to the home)?

No → Consider this **no known significant TB exposure.**

Yes or unsure → Consider this **a significant TB exposure.**

**If someone has TB symptoms, trace and test them, and follow up on their results and drug susceptibility - this may affect the child's TB treatment regimen.*

How to identify growth faltering – see enlarged image on p48:



- Slowing down/flattening of growth curve (plateau)
- Crossing of z-score lines in the last 3 months
- If weight trend is not available: weight-for-age (WFA) on or below the - 2 line
- Caregiver reports noticeable weight loss
- NO improvement in weight trend despite treating what is treatable (deworming, nutritional supplements, ART)

Next, if child has no TB symptoms: check if child is part of a high-risk group on the next page.
Then use the table on the next page to decide whether to start TB Preventive Treatment (TPT).

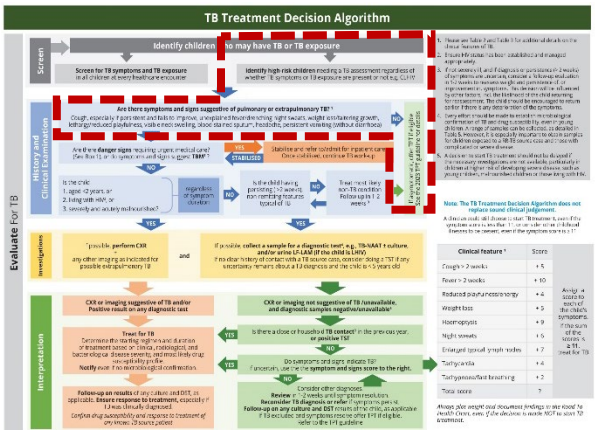
SCREEN FOR TB INFECTION AND TB DISEASE

How to identify high-risk groups eligible for TPT

Regardless of TB exposure (or positive TB skin test), give the following high-risk groups of children a course of TPT provided they have no symptoms of TB and have not already had a course of TPT in the past. If TB symptoms, investigate for TB first.

High-risk groups include:

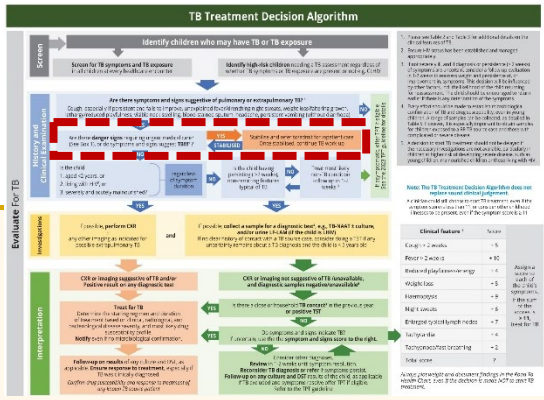
- Child living with HIV
- Child living with another condition currently affecting the immune system, e.g., cancer, autoimmune disease, inherited immune deficiency
- Child receiving dialysis
- Child preparing for an organ or haematological transplant
- Child on medications that affect the immune system, e.g., a child on TNF-inhibitor therapy which may be used to treat illnesses like rheumatoid arthritis, juvenile idiopathic arthritis, Crohn's disease, plaque psoriasis.



Decide whether to start TB Preventive Treatment (TPT)		
• **Significant TB exposure** AND • Not part of a high-risk group AND • No symptoms of TB *(Regardless of previous TPT)*	RISK OF TB INFECTION	• Start TPT – further investigations like TST are not needed: » If child under 25 kg, see p22. » If child or adolescent 25 kg and above, see p23. • Check drug susceptibility of index patient. If index patient has RR-TB, arrange a chest x-ray and start TPT, see p24. • TRACE OTHER CONTACTS. • Follow-up monthly p26.
• Regardless of exposure AND • **Part of a high-risk group** AND • No symptoms of TB AND • Never had a course of TPT previously	RISK OF TB INFECTION	• Start TPT – further investigations like TST are not needed: » If child under 25 kg, see p22. » If child or adolescent 25 kg and above, see p23. • If TB exposure: check drug susceptibility of index patient. If index patient has RR-TB, arrange a chest x-ray and start TPT, see p24. • TRACE OTHER CONTACTS. • Follow-up monthly p26.
• No TB exposure AND • Not part of a high-risk group AND • No symptoms of TB *(Regardless of previous TPT)*	LOW RISK OF TB INFECTION AND TB DISEASE	• No need for TPT or TB treatment at this visit. • Continue with consultation. • Assess for TPT with every new TB exposure.
• No new TB exposure AND • **Part of a high-risk group** AND • No symptoms of TB AND • **Child has completed course of TPT in past**	LOW RISK OF TB INFECTION AND TB DISEASE	• No need for TPT or TB treatment at this visit. • Continue with consultation. • Assess for TPT with every new TB exposure.

- **If significant TB exposure, start TPT in all well children without TB symptoms (regardless of HIV status, age or risk).**
- **If child has a new significant exposure, repeat a course of TPT.**
- **Regardless of exposure status, start TPT in every high-risk child without TB symptoms, who has not previously completed a course of TPT.**

IDENTIFY DANGER SIGNS AND SYMPTOMS OF TB MENINGITIS



How to identify symptoms/signs of TB meningitis (TBM):

- Be aware that the onset of TBM is often vague, with non-specific symptoms already present for days to weeks at diagnosis.
- There are often repeated PHC visits, especially in a child with TB exposure:

ASK ABOUT:		LOOK AND FEEL:
• Cough • Vomiting - mostly without diarrhoea • Irritability • Poor weight gain • Headache • Confusion • Abnormal behaviour	• Sleepiness/reduced level of consciousness • Convulsions • Reduced playfulness - is child less responsive or less interested in playing or interacting with others • Regression of milestones – has child lost skills they have already learned like sitting, crawling, saying words, being toilet trained?	• Weakness on one side • Low-grade fever • Neck stiffness • Bulging fontanelle • Cranial nerve palsies e.g. facial droop, double vision, hearing loss, eye movement problems, new squint, swallowing/speech problems, abnormal drooling

How to check for general danger signs using the IMCI approach

ASK	LOOK
• Is the child able to drink or breastfeed? • Does the child vomit everything? • Has the child had convulsions during this illness?	• Is the child lethargic or unconscious? • Is the child convulsing now?

CLASSIFY ALL CHILDREN

Any general danger sign	**VERY SEVERE DISEASE**	• **If child is unconscious or lethargic, give oxygen (p. 36 in IMCI)** • **Give diazepam if convulsing now (p. 35 in IMCI)** • **Test for low blood sugar, then treat or prevent (p. 35 in IMCI)** • **Give any pre-referral treatment immediately.** • **Quickly complete the assessment** • **Keep the child warm.** • **Refer urgently.**

CHILD WITH ANY GENERAL DANGER SIGN NEEDS URGENT ATTENTION AND REFERRAL:
Quickly complete the assessment, give pre-referral treatment immediately and refer as soon as possible.

How to identify danger signs in more detail:

- General danger signs
  - » Unable to drink or breastfeed
  - » Vomiting everything
  - » Convulsions
  - » Unconscious or lethargic
  - » Any signs of shock
- Signs of severe respiratory illness (any of the following)
  - » Chest indrawing
  - » Stridor in calm child
  - » Oxygen saturation < 92% on room air
  - » Central cyanosis
- Signs of severe dehydration (2 of the following)
  - » Unconscious or lethargic
  - » Sunken eyes
  - » Unable to drink or drinking poorly
  - » Skin pinch goes back very slowly
- Signs of meningitis (any of the following)
  - » Neck stiffness
  - » Bulging fontanelle
  - » Restless, continuously irritable
- Signs of severe anaemia (any of the following)
  - » Severe palmar pallor
  - » HB < 7 g/dl

IDENTIFY WHO NEEDS TB INVESTIGATIONS

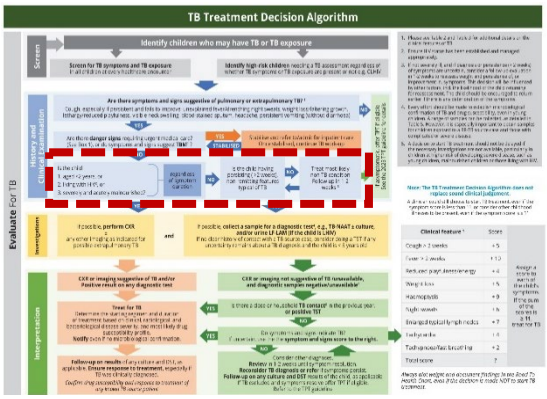
Is the child

1. Aged <2 years, or
2. Living with HIV, or
3. Severely and acutely malnourished?

If any of the above, the child is considered vulnerable.

- Investigate these children early.
- Do not wait for their symptoms to persist.
- They may have few or atypical symptoms.
- They are at high risk of rapid TB progression and may deteriorate quickly.

Early investigation prevents delayed diagnosis and reduces risk of severe disease or death.



How to ensure HIV status has been established and managed appropriately

- If mother/child's status is unknown: do HIV test today.
- If HIV-exposed: test at birth, 10 weeks of age, 6 months of age and 6 weeks after stopping breastfeeding
- Regardless of HIV exposure, test all infants at 18 months of age.
- If clinically indicated, do an HIV test today: i.e. child has features of HIV infection: persistent diarrhoea, pneumonia now, ear discharge, low weight, poor weight gain; enlarged lymph glands in 2 or more sites (neck, axilla or groin), oral thrush, parotid enlargement.
- If child known to be living with HIV:
  - » Check that child is on ART, compliant and doing well - check that result of last viral load is suppressed (VL < 50).
  - » If old enough to produce sputum, test CLHIV for TB once a year when viral load is done, regardless of TB exposure or symptoms/signs.

See p. 32 in IMCI.

How to identify a severely and acutely malnourished child

- Weigh child and measure height.
- Plot child's weight-for-age, height-for-age and weight-for-height in their Road to Health Book (RTHB).
- Now, look more closely at the child's current weight-for-height and the shape of the child's growth curves.
- If the child is 6 months or older, measure the mid-upper arm circumference (MUAC) and record in the RTHB.
- Look for oedema (swelling) of both feet.

Are there any of the following?

- Weight-for-height below -3 line
- BMI-for-age below -3 line
- MUAC less than 11.5cm
- Swelling of both feet

If any of the above: child is considered to have Severe Acute Malnutrition (SAM).

If child known with significant TB exposure and not diagnosed with TB disease (had symptoms that have resolved), remember to start TPT.

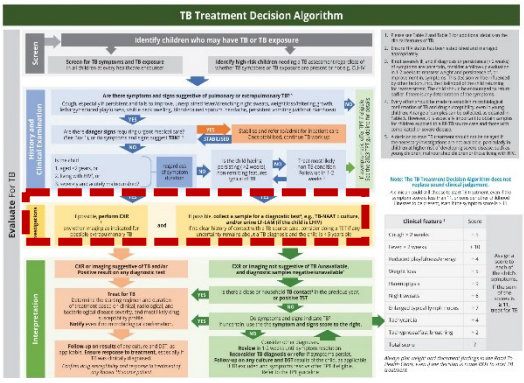
How to manage the child who is not considered vulnerable

- If this child has persisting (> 2 weeks), non-remitting features typical of TB, do TB investigations.

(Note: 'non-remitting' means symptoms are just not getting better).

- If this child does not have persisting or non-remitting symptoms:
  - » Treat the most likely non-TB condition according to IMCI: e.g.
    - Soothe the throat and relieve the cough (p44 in IMCI).
    - If fast breathing, treat as Pneumonia: give amoxicillin for 5 days (p37, IMCI).
    - If wheezing, give salbutamol by inhaler (p36 and p 40 in IMCI).
  - » Arrange to review them again. If likely pneumonia, review in 2 days. Otherwise review in 5 days – 2 weeks' time, depending on severity of symptoms. At review reassess persistence of symptoms and weight.
  - » If unable to return easily for reassessment, and there is a concern for TB, consider investigating earlier.
  - » Advise the caregiver to return earlier if the child's symptoms worsen.

INVESTIGATE FOR TB



- Investigate with what you have available.
- Only refer if you are clinically concerned about the child.

Arrange imaging:

- If possible, arrange for a chest x-ray (request AP/PA and lateral views) to be taken and interpreted.
  - → How to assess quality of x-ray and evaluate chest x-ray (p49) –doctor to interpret.
- If extrapulmonary TB suspected: arrange other imaging such an abdominal ultrasound or CT scan.

Note: the unavailability of tests should not be a barrier to a likely clinical diagnosis. It will depend on what is available at the facility, what referral entails and if a likely diagnosis can be made without complex investigations.

Collect a sample for a diagnostic test

- Every effort should be made to establish microbiological confirmation of TB and drug susceptibility, even in young children. It is especially important to obtain samples for children exposed to a RR-TB index case and those with complicated or severe disease.
- A range of samples can be collected: sputum, induced sputum, gastric aspirate, urine and stool samples.
- Stool samples cannot be cultured. Only collect a stool specimen from a child with TB symptoms when they cannot produce sputum - typically those under 5 years of age (up to 10 years).

  For further detail – see Table 5, p17 in the 2024 NDOH Management of Tuberculosis in Children and Adolescents.

  - → How to do a urine LF-LAM test (p60) if the child is living with HIV.
  - → How to collect an adequate sputum specimen (p56).
  - → How to perform an induced sputum (p58).
  - → How to do a gastric aspirate (p62).
  - → Tips for caregivers when collecting a stool sample (p66).

Consider a non-diagnostic test

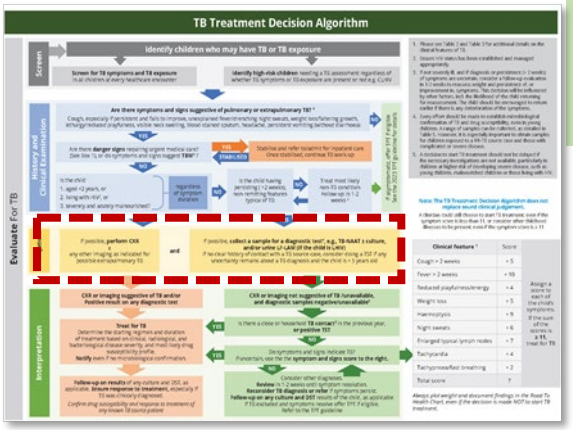
If the child is < 5 years old with no clear history of contact with a TB source case (and no positive Tuberculin Skin Test (TST) in the past), consider doing a TST if any uncertainty remains about a TB diagnosis.

- → How to do a TST (p64).

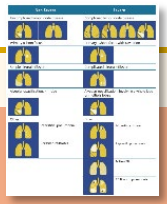
INTERPRET RESULTS

NOTE: a negative TB result does not exclude TB.

Complete the other 'puzzle pieces' to view the whole clinical picture.
TB can be diagnosed clinically.



How to interpret chest x-rays:



If any of: hilar lymphadenopathy; airway narrowing; Gohn focus; pleural effusion; cavitatory disease or miliary picture opacification in lung tissue, collapse of a lobe, abnormality of the thoracic vertebra or paravertebral abscess; pericardial effusion: **consider CXR suggestive of TB.**

If normal chest x-ray: **consider CXR <u>not</u> suggestive or specific for TB.**

How to interpret TB NAAT results (this includes GeneXpert, Xpert, BDMax etc):

As an example, if results say:

TB-NAAT: GeneXpert MTB/Rif Ultra (Sediment)
PCR M. tuberculous result: Mycobacterium Tuberculosis complex detected

Consider this a POSITIVE result for TB. Diagnose TB and check DST results.

As an example, if results say:

TB-NAAT: GeneXpert MTB/Rif Ultra (Sediment)
PCR M. tuberculous result: Mycobacterium tuberculosis complex NOT detected

Consider this a NEGATIVE result for TB.

As an example, if results say:

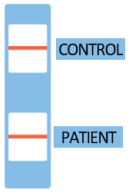
PCR result	Trace
Rifampicin (molecular)	Unsuccessful

- Review this result in individual context and where possible, complete the other diagnostic 'puzzle pieces'.
- If possible, try to repeat sputum specimen and request culture and DST. Ask about previous history of TB and current TB symptoms:
  - » If child was treated for TB in last 2 years and has no TB symptoms currently, then TB is unlikely. Follow up TB culture and DST results when available. If unsure, discuss with helpline, p67.
  - » If no TB treatment in last 2 years or has TB symptoms currently: assess child clinically, arrange chest x-ray to decide on TB treatment. Do not delay treatment if CXR unavailable. If unsure – discuss with helpline p. Follow up culture and DST results.

How to interpret LF-LAM results (only for CLHIV) – for further details see p60:
Use the reference scale card to compare results.

If the test strip shows:

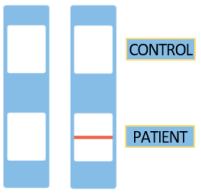
Two lines – one in the control window and one in the patient window:



Consider this a positive result for TB. Diagnose TB.

If the test strip shows:

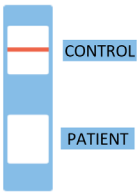
No lines or Only one line in the patient window



Consider this an invalid test. Repeat.

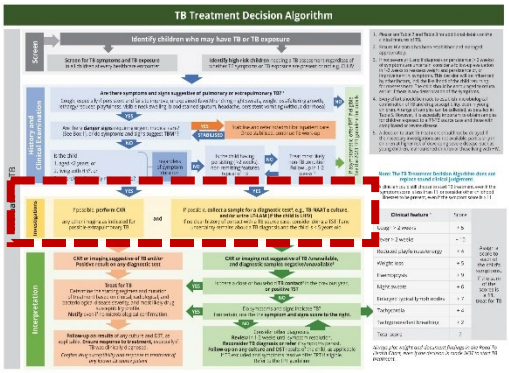
If the test strip shows:

Only one line in the control window



Consider this a negative result for TB.
(Note: this does not EXCLUDE TB)

INTERPRET RESULTS



How to interpret TB culture results:

If results say:

TB Culture:
Mycobacterial Culture Liquid Medium:
Culture result: Culture positive. AFBs observed.
Incubation time: 27 days

Consider this a POSITIVE result for TB.
Diagnose TB and check DST results.

If results say:

TB Culture:
Mycobacterial Culture Liquid Medium:
Growth result: Negative
Incubation time: 42 days
Culture result No growth after 42 days

Consider this a NEGATIVE result for TB

How to interpret DST results

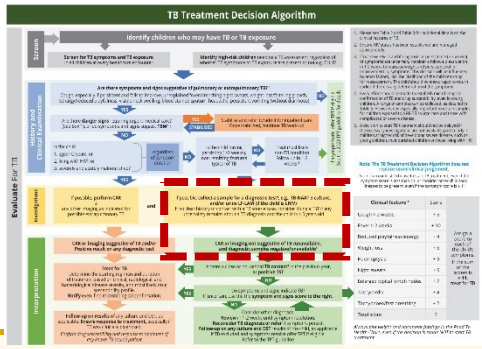
If results say:

TB-NAAT: GeneXpert MTB/Rif Ultra (Sediment)
PCR M. tuberculous result: Mycobacterium tuberculosis complex detected
Rifampicin (molecular) Sensitive
TB-NAAT DR-TB: GeneXpert MTB/XDR (Cultured Isolate)
PCR M. tuberculosis result Mycobacterium tuberculosis complex detected
Isoniazid, INH (molecular) Sensitive
Fluoroquinolone, FQ (molecular) Sensitive
Amikacin, AMK (molecular) Sensitive
Ethionamide, ETH (molecular) Sensitive

Consider this DRUG-SUSCEPTIBLE TB (DS-TB).

DRUG RESISTANCE TERMINOLOGY	
IF THE RESULT SHOWS THE TB IS:	**THEN, CONSIDER IT:**
Resistant to only one anti-TB drug	Mono-resistant TB
Resistant to at least rifampicin, ± resistance to other anti-TB drugs **This includes MDR-TB, Rifampicin mono-resistant TB, Pre-XDR-TB and XDR-TB.*	Rifampicin-Resistant TB (RR-TB).
Resistant to rifampicin and isoniazid (± resistance to other anti-TB drugs)	Multidrug-resistant TB (MDR-TB)
Resistant to more than one anti-TB drug, excluding isoniazid and rifampicin	Poly-drug-resistant TB
Resistant to rifampicin (± resistant to isoniazid), and resistant to fluoroquinolones	Pre-extensively drug-resistant TB (Pre-XDR-TB)
Resistant to: • Rifampicin (± resistant to isoniazid), and • At least one fluoroquinolone (levofloxacin or moxifloxacin) and, • At least one additional Group A drug (e.g. bedaquiline or linezolid)	Extensively drug-resistant TB (XDR-TB)

IF DONE, INTERPRET NON-DIAGNOSTIC TST RESULTS

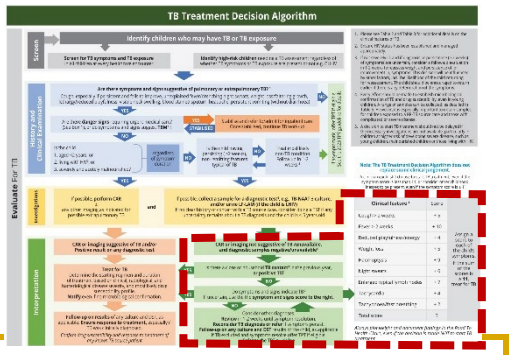


How to interpret TST results (p64):

A TST is designed to confirm TB infection when:

- TB exposure status is unknown, and
- No previous positive TST, and
- No history of TB disease.
- Read at 48-72 hours
- A TST is considered positive if the indurated area measures 10mm or more.
- If malnourished child or CLHIV, TST is considered positive if the indurated area measures 5mm or more. ``

IF INVESTIGATIONS NEGATIVE or UNAVAILABLE, ASSESS FURTHER



How to score TB signs and symptoms

- Use the symptom scoring tool to help diagnose TB at PHC level where tests like CXR may not be available. This tool does not replace sound clinical judgement.
- Record scores for each sign or symptom found during the child's clinical history and physical exam.
- Add the scores and start TB treatment if the total is '11 or higher'.

Example 1

A child presents with a cough for more than 2 weeks, weight loss and swollen lymph nodes.

Clinical feature	Score
Cough >2 weeks	+5
Fever >2 weeks	+10
Lethargy	+4
Weight loss	+5
Haemoptysis	+9
Night sweats	+6
Enlarged typical lymph nodes	+7
Tachycardia	+4
Tachypnoea/fast breathing	+2
Total score	?

5 + 5 + 7 = 17

17 is higher than 11: therefore start the child on TB treatment.

Example 2

A child has a cough for more than 2 weeks, fever for 5 days (0 points as it is less than 2 weeks) and tachypnoea.

Clinical feature	Score
Cough >2 weeks	+5
Fever >2 weeks	+10
Lethargy	+4
Weight loss	+5
Haemoptysis	+9
Night sweats	+6
Enlarged typical lymph nodes	+7
Tachycardia	+4
Tachypnoea/fast breathing	+2
Total score	?

5 + 2 = 7

7 points is lower than 11: therefore, do not start TB treatment yet. Instead, treat for the most likely alternative diagnosis and reassess in 1–2 weeks.

TACHYCARDIA/ FAST HEART RATE	
AGE	**FAST HEART RATE**
Age under 2 months	> 160 beats/min
Age 2-12 months	> 150 beats/min
Age 12 months – 5 years	> 140 beats/min
Age over 5 years	> 120 beats/min

TACHYPNOEA/FAST BREATHING	
AGE	**FAST BREATHING**
Age under 2 months	> 60 breaths/min
Age 2-12 months	> 50 breaths/min
Age 12 months – 5 years	> 40 breaths/min
Age over 5 years	> 30 breaths/min

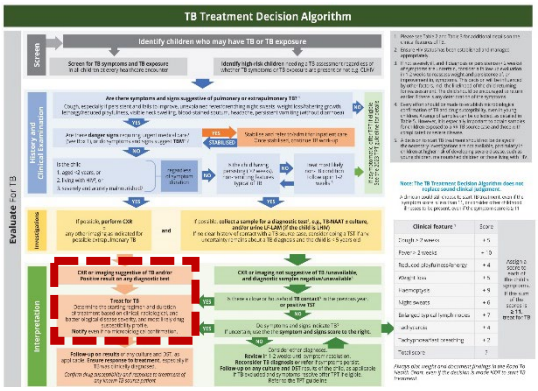
If child known with significant exposure and not diagnosed with TB disease (had symptoms that have resolved), remember to start TPT.

INITIATE TB TREATMENT

If INH-monoresistance detected, see p18.
If RR-TB detected, see p36.

Use these steps to decide on TB regimen*, duration and dose:

STEP 1: Determine eligibility for treatment shortening p30.
STEP 2: Determine regimen and duration on p31.
STEP 3: Determine dose, check for allergies and medication interactions and if needed, adjust doses on p43.
STEP 4: As INH is part of TB treatment, prevent peripheral neuropathy with pyridoxine, especially if malnourished, CLHIV, or breastfeeding infant.

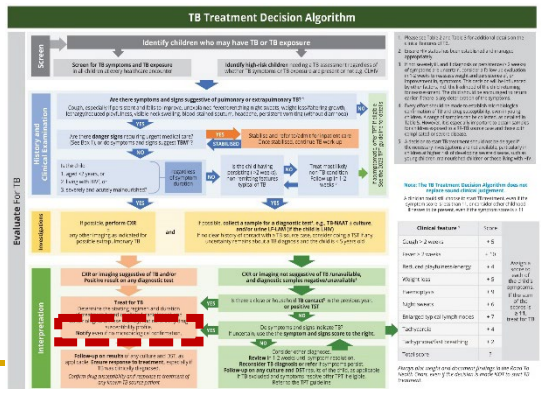


NOTIFY FOR TB DISEASE

'Notify even if no microbiological confirmation" – this means that even if TB was diagnosed using only signs and symptoms (± CXR findings), the health worker needs to notify.

- Notify using the Notifiable Medical Conditions (NMC) App.
- Record:
  1. PHC comprehensive tick register: all patients
  2. TB identification (ID) register (GW20/13): all who screen positive for TB infection or disease.
  3. Clinical stationery:
- The blue facility-held TB Treatment Record (GW 20/12)
- The Ideal Clinic Patient Health Record (if used in your facility)
- The green patient-held TB patient treatment card (GW20/15)
- Tier.net Digital Surveillance System (known before as TB register) or EDR.web (for RR-TB)
  - If started on short-course treatment: register as Regimen 3a.
  - If not eligible for short-course treatment: register as on Regimen 3b.

NMC reporting: https://nmc.nicd.ac.za/ OR App - https://play.google.com/store/apps/details?id=za.NICD.nmcss



EXPLAIN TO PATIENT AND FAMILY

In simple language:

- Explain why you think the child has TB.
- Explain what TB is, why it needs to be treated and why good adherence is important:

"TB is a germ that makes you sick, mostly in the lungs. It can also go to other parts of the body. If we do not treat it, it can spread and cause severe damage or even death. It is important for you to give your child their medicine every day for the whole course, even if they feel better, so the TB goes away and does not come back stronger."

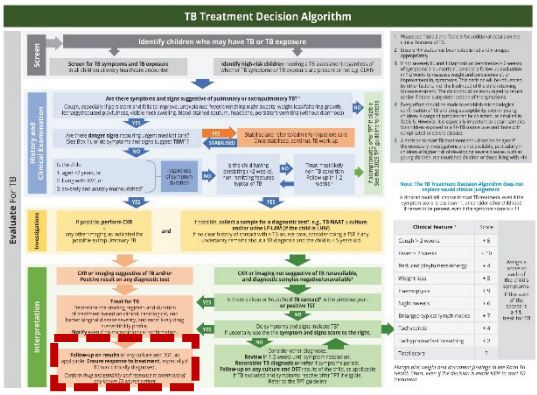
- Explain that TB in adults and teens is more infectious than in children, and the child likely got TB from an adult. Encourage caregiver to identify the source and advise them to visit the clinic.
- Emphasise the importance of screening all contacts of that source. Explain that there is treatment to prevent TB disease developing.
- Explain that the child's energy needs increase with TB and to supplement their diet:

"Give small, frequent meals. Use energy-rich foods like peanut butter, porridge with oil or margarine, mashed avocado, or full-cream milk. Add protein with eggs, beans, lentils, or tinned fish (like pilchards) or liver. Use fruits and vegetables for vitamins – try cooked pumpkin, carrots, spinach, or oranges. Offer snacks like bread with peanut butter or maize meal with milk between meals."

- Explain when and where their next appointment is.
- Check their understanding and ask if they have any questions.

Page 67

MONITOR AND FOLLOW-UP



How to follow-up a child on DS-TB treatment:

- Follow up monthly for the first two months and then every 2 months until treatment is completed.
- Check the following at every visit:
  - » TB symptom improvement (including a decrease in lymph node size)
  - » Weight and growth (update dosages of TB meds)
  - » Immunisations, vitamin A, deworming up to date
  - » Adherence (via pill counts and treatment card checks)
  - » Side effects, especially change in vision
  - » HIV and ART status (if CLHIC, ensure to combine HIV and TB visits)
  - » Outstanding TB NAAT/ TB culture or DST results of patient (and their source patient)

If the child is on a shortened DS-TB regime, check that they remain eligible to continue:

FOLLOW-UP Clinical Criteria

Eligible for shorter treatment if ALL BELOW CRITERIA ARE MET:

- **Adherent** to treatment
- **MONTH 1:** All TB signs & symptoms improved
- **MONTH 4:** All TB signs & symptoms resolved[2] and appropriate/improving weight trend

[2]If cervical peripheral lymph nodes did not decrease in size at month 4, continue to 6 months of treatment. If there was not a significant reduction in size of the lymph nodes, enlargement or complications, especially if TB was not bacteriologically confirmed, refer for further investigation (biopsy or aspiration) to exclude other diagnoses.

If INH-monoresistance is detected:

- If INH mono-resistant TB is detected: give **Rifampicin** + **Pyrazinamide** + **Ethambutol** + **Levofloxacin** - give all for 6 months (with or without INH, using the dispersible RHZ FDC for ease of administration).
- Use doses reflected in weight banded dosing tables (p32, DS-TB) and (p40, DR-TB). Weigh up the benefit of a simpler regimen using the RHZ FDC against the disadvantage of knowingly giving an additional but ineffective drug (INH) and discuss with the caregiver.

Manage the child who deteriorates on treatment or has treatment failure:

See details on p70 in 2024 NDOH Management of Tuberculosis in Children and Adolescents.

AT END OF TREATMENT, RECORD OUTCOME

Record treatment outcome in clinical stationery and Tier.net Digital Surveillance System.

OUTCOME	DEFINITION
Cured	A child who was respiratory specimen culture-positive pre-treatment and is respiratory specimen culture-negative in the last month of treatment and on at least one previous occasion, at least 30 days prior.
Completed treatment	A child who has completed treatment but does not meet the criteria to be classified as cured or treatment failure. Treatment response in a child with sputum smear- or culture-negative TB or extrapulmonary TB as assessed monthly by monitoring the weight of the child and symptom resolution (includes children who were diagnosed without respiratory symptoms).
Treatment success	The sum of treatment cured and completed.
Lost to Follow-Up	A child with treatment interrupted for ≥ 2 consecutive months for any reason without medical approval.
Died	A child who dies for any reason during TB treatment.
Treatment failure	A child who is sputum smear or culture-positive at five months or later after starting treatment.

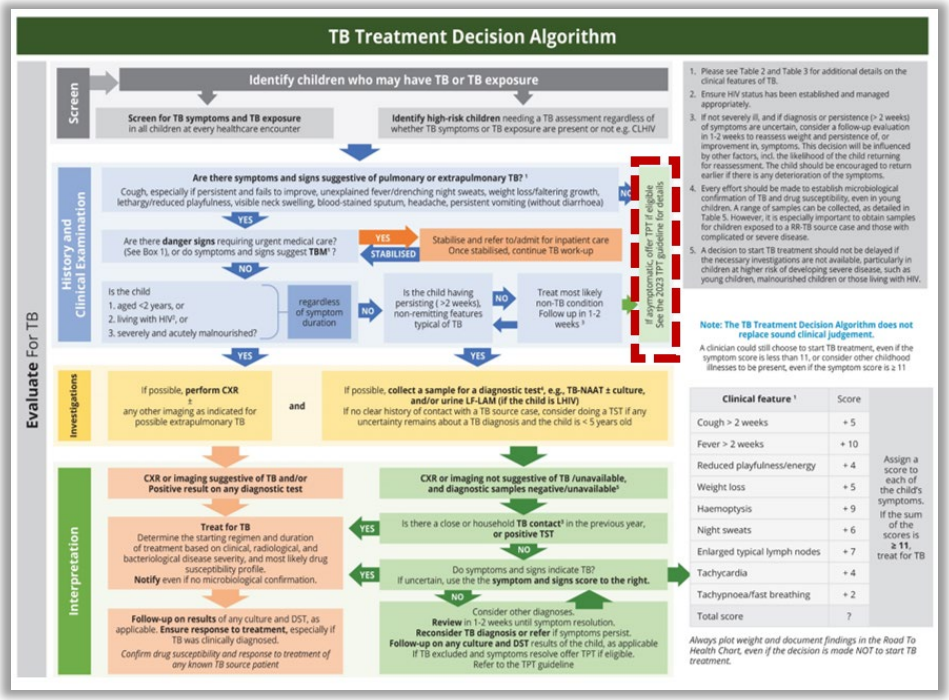
SUMMARY OF CONSULTATION STEPS: screen, test and treat every child for TB

STEPS	INSTRUCTION	ACTION
STEP 1:	**SCREEN**: Screen all children and adolescents: • Have they had a significant TB exposure? • Do they have HIV? • Are they considered high risk? • Do they have any TB symptoms?	If no to all: TB screen is considered negative - continue with consultation. If yes to one or more, go to step 2. Page 9
STEP 2:	**ASSESS AND INTERPRET:** • Ask: age, index patient details, previous TB, symptoms of TB, HIV status, BCG vaccination status • Examine: vitals, weight, growth curves, neck swellings, look, listen and feel according to scope of practice. • Investigate: HIV test. Where able, obtain specimen for TB NAAT (± smear, culture and DST); CXR; LF-LAM, if eligible. Complete symptom score, if needed. Page 13	
	DIAGNOSE • Based on these findings, decide if TB disease likely: • If TB disease is not likely (and either significant exposure or high-risk child), move to step 3 and manage for TB infection. • If TB disease likely: move to step 3 and manage for likely DS-TB disease or RR-TB disease.	If uncertainty and child clinically well, follow-up in 1-2 weeks and review clinical improvement.
STEP 3:	**TREAT:**	
	Treat for likely TB infection: • Check weight, HIV ART status + recent VL results, index patient susceptibility, what TPT other members of family taking.	Based on these findings, choose a TPT regimen for **DS-TB infection**: • If < 25 kg and HIV negative: 3RH • If < 25 kg and HIV positive: 6H • If ≥ 25 kg and HIV negative: 3HP (weekly) or 3RH or 6H • If ≥ 25 kg and HIV positive: 12H or 3HP (if on DTG-based ART with suppressed VL) Page 23 If TB exposure and index patient known with **RR-TB:** » INH monoresistant: 4R » Rif resistance: if confirmed FQ-susceptible: 6Lfx or if 'low INH resistance detected': consider 6hdH » If confirmed INH susceptible: 6H Page 24
	Treat for likely TB disease: • Determine severity and eligibility for shortened TB regimen: age, site/features of disease, HIV status (± VL), clinical and nutritional status, CXR findings, bacteriological results • Determine susceptibility when results available	Determine dose using weight-based dosing charts – see dosing p32. Based on these findings, decide on duration of TB treatment: **For DS-TB:** • Non-severe TB/eligible (PTB or cervical lymphadenitis or simple TB pleural effusion): treat for 4 months total – (2 HRZ + E, then 2 HR) • Severe pulmonary TB and most EPTB: treat for 6 months total (2 HRZ + E, then 4 HR) • TB of bone/joints: treat for 12 months total (2 HRZ + E, then 10 months HR) • TBM, CNS TB and miliary TB: single phase of treatment 6-9 months (HR + Z + Eto). If HIV negative: 6 months. If child living with HIV: 9 months Page 29
		For RR-TB: • Arrange baseline bloods, CXR, culture and reflex DST, smear, ECG. • Pulmonary TB (or TB pleural effusion or TB of lymph nodes): • If < 15 years old: give 6 months BDLLfxC regimen. • If ≥ 15 years old: give 6 months BPaL-L regimen. • TBM, CNS TB, TB of bone/joints, disseminated TB: give longer individualised regimen – contact NCAC, p67. Page 36

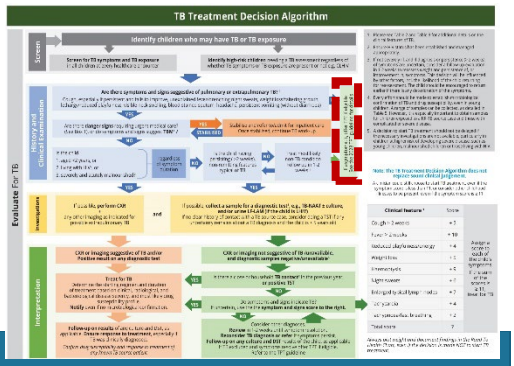
STEPS	INSTRUCTION	ACTION	
STEP 4:	**CHECK FOR POTENTIAL MEDICATION INTERACTIONS** If patient is taking other medication, especially ART, check if prescribed TB medications will interact.	Based on findings, adjust choice or dosing of medications. • If on DTG-based or PI-based ART, manage on p43.	Page 9
STEP 5:	**NOTIFY AS NOTIFIABLE MEDICAL CONDITION| RECORD IN REGISTERS, CLINICAL STATIONERY AND TB CARD**		Page 17
STEP 6:	**EXPLAIN DIAGNOSIS AND PLAN. CHECK UNDERSTANDING. ANSWER QUESTIONS.** If available, provide patient information leaflet. Explain in simple terms. Check understanding – check that caregivers can correctly administer medications. Check if any questions.		Page 67
STEP 7:	**FOLLOW-UP** Check for side effects and adherence. Check weight gain. Ask about new TB symptoms.	Manage side effects promptly. Adjust dose of TB meds according to weight. If TB symptoms, evaluate and investigate further.	Page 18

Section 2

TB Preventive Treatment (TPT) 'TB infection treatment'



TPT FOR CHILDREN UNDER 25kg



- Check the following to guide choice of TB Preventive Treatment (TPT) regimen:
  - » Weight
  - » HIV status
  - » If CLHIV: current ART and recent VL results
  - » Index patient susceptibility
  - » What TPT other members of family will be taking

CHOOSE TPT REGIMEN FOR TB INFECTION IN A CHILD < 25KG

INDICATIONS	TPT REGIMEN
HIV negative AND If TB exposure: index patient has DS-TB	**Give 3RH** (daily rifampicin and isoniazid for 3 months). If 3RH not available, give 6H. Give pyridoxine for duration: If < 5 years old: give 12.5 mg daily (if < 6kg: 6.25 mg(¼ tab) If ≥ 5 years old, give 25 mg daily Follow up monthly (p26).
Child living with HIV AND If TB exposure: index patient has DS-TB (Regardless of on ART/starting ART)	**Give 6H** (daily isoniazid for 6 months). Give pyridoxine for duration: If < 5 years old: give 12.5 mg daily (if < 6kg: 6.25mg (¼ tab) If ≥ 5 years old, give 25 mg daily Follow up monthly (p26).
Infant born to HIV-positive woman and on nevirapine ± zidovudine (infant HIV-exposed but HIV-negative)	**Give 6H** (daily isoniazid for 6 months). Give pyridoxine 12.5 mg daily for duration (if < 6kg: give 6.25 mg (¼ tablet) Follow up monthly (p26).
If TB exposure: and index patient has DR-TB	Give treatment for RR-TB infection (p24). Follow up monthly (p26).

3RH FOR TB INFECTION IN THE HIV NEGATIVE CHILD < 25 KG GIVE ONCE DAILY (on an empty stomach)

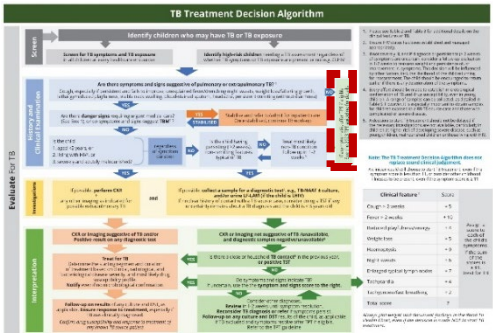
RH (DAILY) FIXED DOSE COMBINATIONS			DURATION
WEIGHT BAND (kg)	75/50 mg TABLET	IF CRUSHED AND MIXED IN WATER*	
2 – 2.9	½ tablet	Mix 1 tablet in **4mL** of water. Give only **2mL** of this mixture.	3 months
3 – 3.9	¾ tablet	Mix 1 tablet in **4mL** of water. Give only **3mL** of this mixture.	
4 – 5.9	1 tablet	Mix 1 tablet in **4mL** of water and give **ALL** of this mixture.	
6 – 7.9	1 ½ tablets	Mix 1 ½ tablets in **5-10mL** of water and give **ALL** of this mixture.	
8 – 11.9	2 tablets	Mix 2 tablets in **5-10mL** of water and give **ALL** of this mixture.	
12 – 15.9	3 tablets	Mix 3 tablets in **5-10mL** of water and give **ALL** of this mixture.	
16 – 24.9	4 tablets	Mix 4 tablets in in **5-10mL** of water and give **ALL** of this mixture.	
≥ 25	Use adult formulations and doses		

6H FOR TB INFECTION IN CHILDREN LIVING WITH HIV < 25 KG GIVE ONCE DAILY (on an empty stomach)

WEIGHT BAND (kg)	INH 100 mg TABLET*	DURATION
2 – 3.4	¼ tablet	6 months
3.5 – 4.9	½ tablet	
5 – 7.4	¾ tablet	
7.5 – 9.9	1 tablet	
10 – 14.9	1 ½ tablets	
15 – 19.9	2 tablets	
20 – 24.9	3 tablets (or one 300 mg tablet)	
≥ 25	Use adult formulations (maximum dose 300 mg per day)	
*Tablets can be crushed and dissolved in a small amount of water if necessary.		

TPT FOR THE CHILD 25 kg AND OVER

- Check the following to guide choice of TB Preventive Treatment (TPT) regimen:
  - » Weight
  - » HIV status
  - » If CLHIV: current ART and recent VL results
  - » Index patient susceptibility
  - » What TPT other members of family will be taking



CHOOSE TPT REGIMEN FOR TB INFECTION IN A CHILD ≥ 25KG	
HIV negative AND If TB exposure: index patient has DS-TB	Give 3HP (weekly isoniazid and rifapentine for 3 months). If 3HP not available, give 3RH. If 3RH not available, 6H. AND Give pyridoxine 25 mg daily for duration of TB infection treatment. Follow up monthly (p26).
Child/adolescent living with HIV, on ART with a viral load < 50 in last 6 months. AND If TB exposure: index patient has DS-TB	Give 3HP (weekly isoniazid and rifapentine for 3 months). If 3HP not available, give 12H. AND Give pyridoxine 25 mg daily for duration of TB infection treatment. Follow up monthly (p26).
Child/adolescent living with HIV, starting ART, or on ART with an unsuppressed viral load (≥ 50) in last 6 months AND If TB exposure: index patient has DS-TB	Give 12H (daily isoniazid for 12 months). Give pyridoxine 25 mg daily for 12 months. Follow up monthly (p26).
If TB exposure: and index patient has DR-TB	Give treatment for RR-TB infection (see table on p24). If giving isoniazid, give pyridoxine 25 mg daily for 6 months.

3HP FOR TB INFECTION
CHILD ≥ 25 kg (HIV NEG/ CLHIV ON ART AND RECENT VL< 50)
GIVE ONCE WEEKLY (WITH OR IMMEDIATELY AFTER FOOD)

Weight band (kg)	Rifapentine 150 mg tablets (weekly)	Isoniazid 300 mg tablets (weekly)	Duration
25 – 29.9	4	2	3 months
≥ 30	6	3	3 months

3RH FOR TB INFECTION
IN THE HIV NEGATIVE CHILD ≥ 25 kg
GIVE ONCE DAILY (ON AN EMPTY STOMACH)

Weight band (kg)	RH (150/75)	RH (300/150)	Duration
25 – 37.9	2 tablets	-	3 months
38 – 54.9	3 tablets	-	3 months
≥ 55	-	2 tablets	3 months

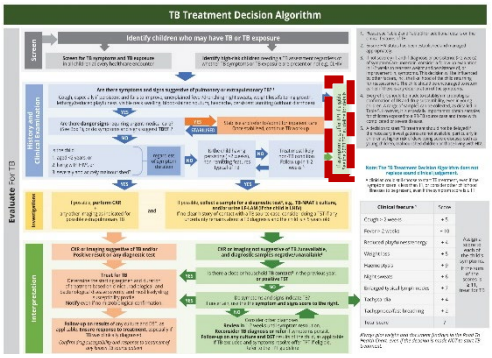
6H FOR TB INFECTION
IN THE HIV NEGATIVE CHILD ≥ 25 kg
GIVE ONCE DAILY (ON AN EMPTY STOMACH)

Drug	Dose	Maximum dose/day	Duration	Interval
Isoniazid (H)	5mg/kg	300mg*	6 months	Daily

12H FOR TB INFECTION
IN THE CHILD LIVING WITH HIV ≥ 25 kg
GIVE ONCE DAILY (ON AN EMPTY STOMACH)

Drug	Dose	Maximum dose/day	Duration	Interval
Isoniazid (H)	5mg/kg	300mg*	12 months	Daily

TPT FOR RR-TB INFECTION (1)

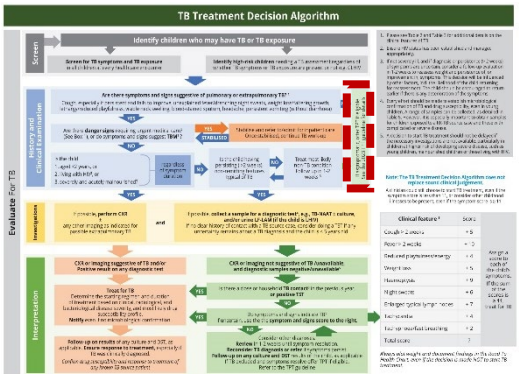


CHOOSE TPT REGIMEN FOR RR-TB INFECTION	
Index patient has RR-TB susceptible to fluoroquinolones (FQ).	• Give 6Lfx: levofloxacin (LFx) daily for 6 months. • Follow up monthly (p26).
Index patient has RR-TB resistant to fluoroquinolones (FQ) - Pre XDR.	• Discuss with specialist: » If no INH resistance or 'low INH resistance detected': consider 6hdH: high-dose isoniazid daily for 6 months (p25). AND » Give pyridoxine for 6 months (p25). • Follow up monthly (p26).
Index patient has XDR-TB.	Discuss with specialist: currently no effective TB preventive treatment available. Close follow-up is essential.
Index patient has isoniazid mono-resistant TB.	• Give 4R: rifampicin daily for 4 months. • Follow up monthly (p26).
Index patient has rifampicin mono-resistant TB (confirmed INH susceptibility by phenotypic/culture-based method).	• Give 6H: isoniazid daily for 6 months. • Give pyridoxine for 6 months. • Follow up monthly (p26).

6LFX FOR RR-TB INFECTION SUSCEPTIBLE TO FLUOROQUINOLONES GIVE ONCE DAILY FOR 6 MONTHS (WITH FOOD)		
Formulations	100 mg dispersible tablet DT** OR 10 mg/mL suspension	250 mg tablet OR 500 mg tablet OR 25 mg/mL suspension
Target dose	15-20 mg/kg/day (maximum daily dose 1.5 g)	
Practical advice	• For older children able to swallow tablets/capsules whole, avoid crushing and mixing tablets/capsules with water - this may make it taste worse than swallowing tablets whole. • Discard any unused portion of a solution you have mixed at home. Dispersible tablets (DT) can either be dispersed in a liquid or mixed with a soft or semi-soft food such as a spoonful of yoghurt or porridge.	
	For a 10 mg/mL suspension: crush and disperse 1 x 100 mg DT in 10 ml water	For a 25 mg/mL suspension: crush and disperse 1 x 250 mg tablet in 10 mL water
Weight band (kg)	Consult with a clinician experienced with DR-TB prescribing for children weighing < 5 kg. Refer to adult guidelines in children > 46 kg and > 15 years of age.	
3 – 4.9	5 mL OR ½ x 100 mg DT daily	2 mL daily
5 – 6.9	1 x 100 mg DT daily	5 mL **OR** ½ x 250 mg tab daily
7 – 9.9	1½ x 100 mg DT daily	
10 – 15.9	2 x 100 mg DT daily	1 x 250 mg tab daily
16 – 23.9	3 x 100 mg DT daily	1½ x 250 mg tab daily
24 – 29.9	5 x 100 mg DT daily	2 x 250 mg tab daily **OR** 1 x 500 mg tab daily
30 - 46	-	1½ x 500 mg tab OR 3 x 250 mg tabs daily

**DT – dispersible table - Only available via Section 21. Not available at all facilities.

TPT FOR RR-TB INFECTION (2)



PYRIDOXINE FOR THE PREVENTION OF INH-ASSOCIATED PERIPHERAL NEUROPATHY GIVE ONCE DAILY	
Target dose	1-2 mg/kg/day
Less than 5 years old	• If weight < 6 kg: 6.25 mg/d (¼ x 25 mg tablet) • If weight ≥ 6 kg: 12.5 mg/d (½ x 25 mg tablet)
5 years or older	25 mg/d

6HIGH-DOSE ISONIAZID (HDH) FOR RR-TB INFECTION RESISTANT TO FLUOROQUINOLONES GIVE ONCE DAILY FOR 6 MONTHS		
Formulations	100 mg tablet OR 10 mg/mL suspension	300 mg tablet
Target dose	15 - 20 mg/kg/day (maximum daily dose 600 mg)	
Weight band (kg)	Note: For 10 mg/mL suspension: crush and disperse 1x 100 mg tablet in 10 mL water.	
3 – 4.9	5 mL daily OR ½ x 100 mg tab daily	-
5 – 6.9	1 x 100 mg tab daily	
7 - 9.9	1½ x 100 mg tabs daily	
10 - 15.9	2 x 100 mg tabs daily	
16 - 23.9	3 x 100 mg tabs daily	1 x 300 mg tab daily
24 - 35.9	4 x 100 mg tabs daily	1½ x 300 mg tabs daily
36 - 46	4½ x 100 mg tabs daily	

RIFAMPICIN (4R) FOR INH MONO-RESISTANT TB INFECTION GIVE ONCE DAILY FOR 4 MONTHS			
< 10 years old	15mg/kg daily	Rifampicin comes in 150 mg capsules: open capsule/s into 10mL of water. Then calculate volume of this mixture to give based on dose/kg.	If rifampicin unavailable, discuss alternative with expert.
≥ 10 years old	10mg/kg daily		

6H FOR RIFAMPICIN MONO-RESISTANT TB INFECTION GIVE ONCE DAILY FOR 6 MONTHS (ON AN EMPTY STOMACH)	
Weight band (kg)	**Daily Isoniazid (INH) 100 mg tablet**
2 – 3.4	¼ tablet
3.5 – 4.9	½ tablet
5 – 7.4	¾ tablet
7.5 – 9.9	1 tablet
10 – 14.9	1½ tablet
15 – 19.9	2 tablets
20 – 24.9	3 tablets (or one 300 mg tablet)
≥ 25	Use adult formulations (maximum dose 300 mg per day)

TPT FOLLOW UP

- Follow up monthly until treatment is completed. Align visits with any other clinic visits.
- Check the following at every visit:
  - » Development of TB symptoms
  - » Weight and growth (update dosages of TB meds)
  - » Immunisations, vitamin A, deworming up to date
  - » Adherence (via pill counts)
  - » Side effects
  - » HIV and ART status
  - » Outstanding TB NAAT/ TB culture or DST results of patient (and their source patient)

TPT INTERRUPTION

Missed only 1 dose:

- If on daily medicine - if same day, take missed dose as soon as remembered. If next day, take next dose as scheduled and continue daily dosing. Advise to avoid taking 2 doses on same day.
- If on weekly medicine - take missed dose as soon as remembers within 3 days. Advise to take next dose as scheduled or start new weekly schedule from day missed

If on 3HP, 3RH, or 4R

Check ABCDE (adherence, bugs (recent illnesses), correct doses, drug interactions, drug resistance.

- If interrupted for < 1 month:
  - » If no TB symptoms, continue TPT. Add missed doses at the end of treatment.
  - » If TB symptoms, investigate further.
- If interrupted for ≥ 1 month:
  - » If still eligible for TPT (TB exposure/high-risk child), restart TPT.

If on 6H or 12H

Check ABCDE (adherence, bugs (recent illnesses), correct doses; drug interactions; drug resistance

- If interrupted < 3 months:
  - » If no TB symptoms, continue TPT. Add missed doses at the end of treatment.
  - » If TB symptoms, investigate further.
- If interrupted for ≥ 3 months:
  - » If still eligible for TPT (TB exposure/high-risk child), restart TPT.

If interrupted TPT for a 2nd time Regardless of duration of interruption - avoid restarting TPT. Reassess child for TPT if TB contact.

- Re-screen for TB symptoms.
- If asymptomatic, restart TPT regimen unless no prior history of TB exposure and no longer classified as high-risk e.g. no longer on immunosuppressives).

TPT OUTCOME

OUTCOME	DEFINITION
Treatment completed	Individual who has taken treatment and completed preventive treatment within the prescribed period.
Lost to follow-up	An individual whose treatment was interrupted for four weeks or more (if on three/ four regimen) OR two consecutive months (if on a six-month regimen) OR three consecutive months (if on a 12-month regimen) during the treatment period.
Treatment stopped	An individual whose treatment was stopped during the treatment period, because of serious adverse events or development of TB disease.
Died	Death for any reason during the treatment.

Algorithm for the management of the TB exposed newborn

Newborn exposed to TB (born to a mother diagnosed with TB during antenatal or peripartum care, or a newborn with other significant TB exposure[1])

Does the baby have active TB disease?

Do a thorough clinical assessment
Assess for symptoms/signs of TB disease.
Do a CXR if available.
Give BCG at discharge from delivery unit[2]

Clinical assessment suggestive of active TB disease in the newborn

Telephonic consultation with expert
OR
Undertake appropriate clinical and laboratory investigation in newborn
OR
Refer newborn to hospital

(Hospital-based) TB Evaluation
- Clinical examination incl. general, respiratory and abdominal
- CXR (anteroposterior and lateral where feasible)
- Abdominal ultrasound if any abdominal distension or hepatosplenomegaly
- Respiratory specimens (e.g., gastric aspirate or induced sputum) for *M.tb* microbiology (TB-NAAT, culture, AFB microscopy)
- Lumbar puncture for CSF evaluation if clinically indicated or if CXR suggests miliary TB
- HIV testing, if not yet done

No indications of active TB

Is the mother or close contact still potentially infectious?

Does the mother or close contact have any one of the following that indicates she could still be infectious?
- On TB treatment < 2 months, OR
- Symptoms that are not improving, OR
- Sputum smear or culture has not yet converted to negative, or is unknown at the time of birth

Refer/discuss any mother who is not responding to TB treatment as expected

No TB disease (exposed only)

Clinically diagnosed/confirmed TB
- Start appropriate TB treatment (according to mother's or neonate's isolate DST results if available)
- Give ARVs (prophylaxis or ART) if indicated
- Follow up monthly for dose-adjustment and clinical evaluation including adverse effects
- **Repeat BCG** upon completion of TB treatment, as indicated in Figure 13

NO / YES

Is the baby eligible for TPT?
If eligible, what TPT regimen should the baby receive?

Baby does not require TPT

Baby requires TPT

Refer/discuss any mother diagnosed with drug resistant TB with an expert[3]

Determine if mother has DS or DR TB

Mother has DS TB or drug susceptibility unknown

HIV-exposed/HIV-positive baby on NVP, DTG or LPV/r or on any other drug with rifampicin interaction?

YES / NO

6H[4]

3RH[4]

Support adherence, evaluate for side-effects, monitor weight and adjust doses, evaluate for TB symptoms until TPT completed. Ensure that HIV testing and prophylaxis (or ART treatment) has been provided as appropriate

Repeat BCG [2]

1. Significant exposure is known (documented) exposure to a person (adult or adolescent) with pulmonary TB who shared the same enclosed space for one or more nights (e.g. at home or similar) or for frequent or extended daytime periods (e.g. at a school, crèche or similar) during the three months before the index patient started TB treatment.
2. All infants should receive BCG at discharge from the delivery unit as per the routine EPI schedule. However, BCG is a live attenuated M.bovis vaccine and is killed by TB medications, including those used in TPT or TB treatment. This may affect the effectiveness of the BCG vaccine. For this reason, the BCG vaccine should be repeated immediately on completion of either TPT or TB treatment.
3. For management of DR-TB exposure, refer to the latest National DR-TB Guidelines
4. For TPT Dosing Table see Annexure 3

Abbreviations: BCG Bacillus Calmette-Guérin; CNS Central nervous system; DS Drug susceptible; DR Drug resistant; 6H 6 months of INH; 3RH 3 months of rifampicin and INH; TPT tuberculosis preventive treatment.

Management of the newborn exposed to TB

WHEN TO GIVE THE BCG VACCINE

IN DELIVERY UNIT	IF INFANT INITIATED TPT OR TB TREATMENT IN THE FIRST 6 WEEKS OF LIFE:
All healthy newborns should receive BCG at discharge *(regardless of HIV status or TB exposure status[1])* If living with HIV, initiate ART immediately. For infants that are transferred to a neonatal unit, the timing of BCG vaccination will depend on the infant's clinical status.	**Repeat BCG after completion of TPT or TB Treatment[2]** If the infant is also LHIV, they should be on ART, clinically well, and have a CD4 > 25%[3] to be able to receive a second BCG[**] *(this repeat BCG can be given on right arm)*. [**] If the criteria to receive second BCG are *not* met, i.e., the infant is: » Not on ART, *or* » Unwell, *or* » CD4 < 25% → Delay BCG until on ART and immunologically stable (CD4 > 25%) → Start/continue TPT until the child is eligible to receive BCG

[1] In the current data-free context, the recommendation to give all infants BCG at birth is based on operational considerations. The decision to give BCG or not and initiate TPT are often made by different people and sometimes in different facilities. When an intervention requires more than one service provider, more than one service location and multiple patient visits, the neonate may miss getting a BCG when indicated at birth, either because of a lapse in communication and continuity of care or because multiple visits become burdensome to the family.

[2] BCG vaccination should be done 24 hours after the last anti-TB treatment dose.
Exceptions: If the infant received rifapentine, give BCG at least 5 days after the last dose. If the infant received bedaquiline or clofazimine, give BCG vaccination two months after the last dose.

[3] After TPT/TB treatment is completed, an additional CD4 count may be done to determine if the infant meets the criteria for receiving BCG.

Management of the neonate who is diagnosed with HIV (without TB exposure):

If BCG given at birth:

» Infants diagnosed with HIV with *no known* TB exposure are only eligible for TPT from 14 weeks of age (ART guidelines, 2023). These children do not require a repeat BCG vaccine once TPT completed.

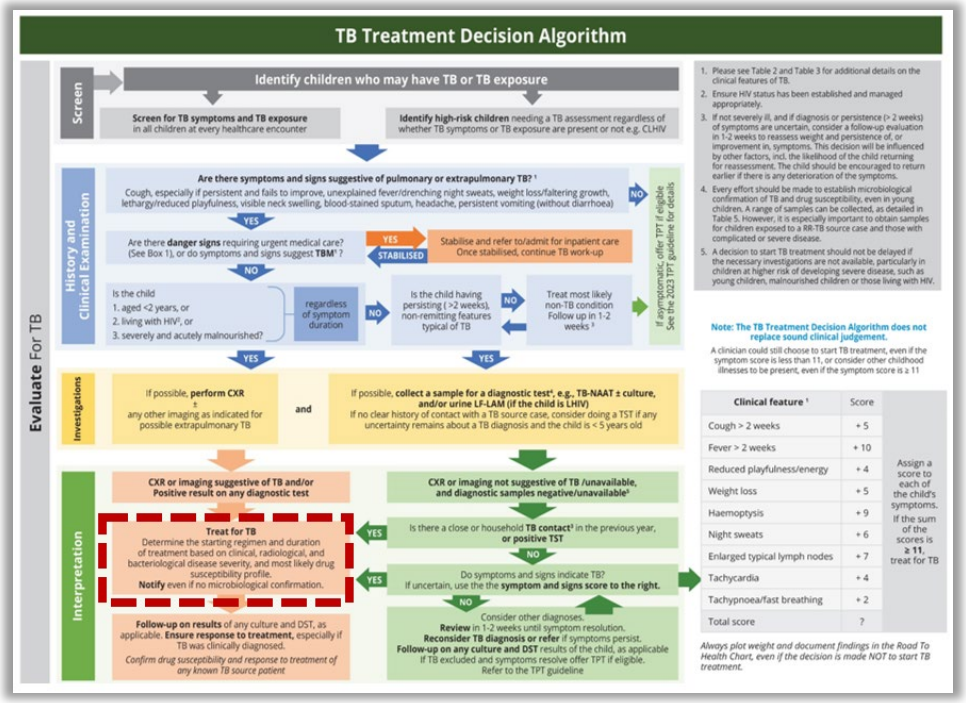
If BCG was missed at birth:

Infants diagnosed with HIV with *no known* TB exposure are only eligible for TPT from 14 weeks of age (ART guidelines, 2023). These children should receive BCG once TPT completed, provided they are on ART, clinically well, and CD4 > 25%.

Remember to document in the Road to Health Card.

Section 3

DS-TB Treatment



HOW TO DETERMINE ELIGIBILITY FOR SHORTENED COURSE DS-TB TREATMENT REGIMEN

Work through steps 1-6 below to assess eligibility to start shortened course of DS-TB treatment:

INCLUSION CRITERIA FOR SHORT-COURSE	EXCLUSION CRITERIA FOR SHORT-COURSE
STEP 1. AGE OF THE CHILD	
• If no CXR available: child between ages of 3 months and 8 years • If CXR available: child between ages of 3 months and 15 years	• Child is under 3 months old • If no CXR available: child is 8 years or older • If CXR available: child is 15 years old or older
STEP 2. SITE AND FEATURES OF DISEASE	
• PTB • Cervical lymphadenitis • Simple TB pleural effusion • First episode	• Extrapulmonary TB • Disseminated TB • Miliary TB • TB meningitis • TB bone or joint • Previous TB treatment
STEP 3. HIV STATUS	
• HIV negative • CLHIV on ART for at least 3 months AND VL < 1000 in the last 3 months	• Newly diagnosed HIV • On ART for < 3 months • Unsuppressed VL (VL ≥ 1000 in the last 3 months)
STEP 4. CLINICAL AND NUTRITIONAL STATUS	
• Clinically well without Severe Acute Malnutrition (SAM) – see p12	• Any danger signs – see p11 • Severe Acute Malnutrition (SAM) – see p12 • Asymmetric or persistent wheezing
STEP 5. RADIOLOGICAL SEVERITY (if x-ray available) – see images p54-55	
• **Uncomplicated hilar lymphadenopathy**: with no airway obstruction/compression • Uncomplicated TB pleural effusion • Consolidation/opacification: < 1 lobe involved • No cavities • No miliary pattern	• **Complicated hilar lymphadenopathy**: i.e., airway obstruction/ compression, deviation and/or hyperinflation or collapse. • **Complicated TB pleural effusion:** i.e., loculated effusion, empyema or associated pneumothorax • Consolidation/opacification: ≥ 1 lobe involved • Cavities • Miliary infiltrates
STEP 6. BACTERIOLOGICAL SEVERITY	
• No sputum sample that is AFB smear positive	• AFB smear positive on sputum sample

If **NO exclusion** criteria, child is **ELIGIBLE** for shortened TB treatment regimen: start short-course regimen (**4 months** in total).

If **ANY exclusion** criteria, child is **NOT ELIGIBLE** for shortened TB treatment regimen: start **6-12 months** TB treatment. Decide on duration according to site of disease/HIV status p31.

IF ON SHORT COURSE, REASSESS ELIGIBILITY AT THE END OF MONTH 1 AND 4	
• Adherent to TB treatment • MONTH 1: TB signs and symptoms improved • MONTH 4: All TB signs & symptoms resolved and appropriate/ improving weight trend	• Non-adherent to treatment • MONTH 1: TB signs and symptoms persisting (not improved) • MONTH 4: TB signs and symptoms have not completely resolved or weight trend not improving
Treatment may be stopped once child completed 4 months.	**Extend treatment to 6 months.**

HOW TO DETERMINE TB TREATMENT REGIMEN AND DURATION

SEVERITY	SITE OF TB	DURATION	MEDICATIONS
ELIGIBLE *for TB treatment shortening*	• Non-severe pulmonary TB • Cervical lymphadenitis • Uncomplicated TB pleural effusion	**4 months in total**	2 months of HRZ + E, followed by 2 months of HR – see dosing p32.
NOT ELIGIBLE *for TB treatment shortening*	• Severe pulmonary TB • Complicated TB pleural effusion • Extrapulmonary TB » This excludes TBM, CNS, TB, miliary, bone, joint (see below) » For TB abdomen in a CLHIV– consider 9 months treatment.	**6 months in total**	2 months of HRZ + E, followed by 4 months of HR – see dosing p32.
	• EPTB of bone and joint » This includes TB spine (Pott's disease)	**12 months in total**	2 months of HRZ + E, followed by 10 months of HR – see dosing p32.
	• Extrapulmonary TB » Miliary TB » TB meningitis » CNS TB (central nervous system TB includes TB meningitis, tuberculoma)	**6-9 months in total**	Single phase of 6-9 months of HR + Z + Eto – see dosing p33. • If HIV negative, treat for at least 6 months. • If child living with HIV, treat for at least 9 months.

TB TREATMENT IN HIV CO-INFECTED CHILDREN

- DTG-containing regimens are preferred for all patients, including those on TB treatment.
- Start/re-start or transition all patients to a DTG-containing regimen, if possible.

IF TB DIAGNOSED BEFORE STARTING ART:

- Start ART as soon as TB treatment is tolerated (ideally within 2 weeks).
- If TBM/CNS TB: delay starting ART until 4 weeks after starting TB treatment.

IF TB DEVELOPS WHILE ON ANTIRETROVIRAL THERAPY (ART):

- ART should be continued throughout TB treatment.
- TB treatment should be started at standard doses.
- Assess adherence, do VL and do CD4 if VL not suppressed.
- Ensure patient is on cotrimoxazole prevention therapy.
- Adjust ART choice/doses according to what ART regimen child is on – see p43.

2024 TB DRUG DOSING CHART FOR CHILDREN / ADOLESCENTS <15 YEARS

WITH CONFIRMED/CLINICALLY DIAGNOSED DRUG-SUSCEPTIBLE/PRESUMED DRUG-SUSCEPTIBLE NON-SEVERE TB, SEVERE PULMONARY TB AND EXTRAPULMONARY TB (EPTB) excluding TB meningitis / central nervous system (CNS) TB / miliary TB (refer to chart on next page)

***Non-severe TB = intrathoracic lymph node TB without airway obstruction, simple TB pleural effusion (i.e. NOT loculated effusion/empyema/associated pneumothorax), isolated perihilar opacities, consolidation involving less than an entire lobe with no cavities or miliary pattern, or isolated cervical lymph node TB**
Severe pulmonary TB = children & adolescents <15 years who do not meet the criteria for non-severe TB

Treatment phase	Intensive phase Once daily, 7 days a week		Continuation phase Once daily, 7 days a week			Treatment phase
Duration	2 months		*Non-severe TB	Severe PTB & most EPTB	Bone & joint TB	Duration
			2 months	4 months	10 months	
Target dose (range)	Isoniazid (H): 10 (7-15) mg/kg; Rifampicin (R): 15 (10 - 20) mg/kg; Pyrazinamide (Z): 35 (30 – 40) mg/kg; Ethambutol (E): 20 (15 – 25) mg/kg					Target dose (range)
Body weight (kg)	HRZ 50/75/150 mg dispersible tablet (scored) OR 50/75/150 mg/4 ml suspension[1]	E 400 mg tablet (not scored) OR 400 mg/8ml suspension[2]	HR 50/75 mg Dispersible tablet (scored) OR 50/75 mg/4 ml suspension[1]			Body weight (kg)
<2	Obtain expert advice					<2
2 – 2.9	½ tab	1 ml	½ tablet			2 – 2.9
3 – 3.9	¾ tablet (3 ml)[1]	1.5 ml	¾ tablet (3 ml)[1]			3 – 3.9
4 – 7.9	1 tablet	2.5 ml	1 tablet			4 – 7.9
8 – 11.9	2 tablets	½ tablet or 4 ml	2 tablets			8 – 11.9
12 – 15.9	3 tablets	¾ tablet or 6 ml	3 tablets			12 – 15.9
16 – 24.9	4 tablets	1 tablet or 8 ml	4 tablets			16 – 24.9
≥25	HRZE (75/150/400/275 mg)#		Choose one of the below options			≥25
			HR 75/150 mg tab	HR 150/300 mg tab		
25 – 29.9	2 tablets		2 tablets	1 tablet		25 – 29.9
30 – 34.9	3 tablets		3 tablets	-		30 – 34.9
35 – 64.9	4 tablets		4 tablets	2 tablets		35 – 64.9
≥65	5 tablets		5 tablets	-		≥65

[1] To make an oral suspension, for weight band 3 – 3.9 kg, for each dose, disperse 1 x HRZ 50/75/150 mg tablet (2 months intensive phase) or 1 x HR 50/75 mg tablet (continuation phase) in **4 ml** of water, administer 3 ml, discard unused suspension. For other weight bands, an oral suspension can be made by dispersing the required number of tablets & fractions of tablets in a small amount of water (5-10 ml) and administering all of the suspension to the child orally or via nasogastric tube.
[2] If oral suspension required, for each dose, crush 1 x ethambutol 400 mg tablet to a fine powder, disperse in **8 ml** of water to prepare a concentration of 400 mg/8 ml (50 mg/ml), administer required dose as indicated in above chart, discard unused suspension.

CHILDREN SHOULD BE TAUGHT AND ENCOURAGED TO SWALLOW WHOLE TABLETS OR, IF REQUIRED, FRACTIONS OF TABLETS SO AS TO AVOID LARGE VOLUMES OF LIQUID MEDICATION

*ELIGIBILITY CRITERIA FOR SHORTER 2 MONTHS CONTINUATION PHASE: ALL CRITERIA SHOULD BE MET

AT DIAGNOSIS
Clinical

- 3 months - <16 years at start of TB treatment
- Drug-susceptible pulmonary TB or cervical TB lymphadenitis (& no other extrapulmonary TB)
- First episode of TB treatment
- No danger signs# indicating severe illness at presentation
- No severe acute malnutrition
- No asymmetric or persistent wheezing
- If living with HIV, must be on ART for at least 3 months with viral load <1000 at TB diagnosis or in the previous 3 months
- If no CXR available at start of TB treatment, must be 3 months - <8 years, HIV negative and no acid-fast bacilli smear positive respiratory samples (if done)

Radiological – NONE of the following should be present

- Complicated intra-thoracic lymph node TB (airway compression/deviation and/or hyperinflation/collapse)
- Consolidation involving ≥1 lobe
- Complicated pleural effusion (loculated effusion, empyema, pneumothorax)
- Miliary pattern
- Cavities

AT FOLLOW-UP
Clinical

- Adherent to treatment
- Month 1: all TB symptoms & signs improved including weight
- Month 4: all TB symptoms and signs resolved & improving weight trend

Those not meeting the eligibility criteria should receive 4 months continuation phase (or 10 months for bone & joint TB)
 # Refer to Table on next page

NEED HELP?

Contact the TOLL-FREE National HIV & TB Health Care Worker Hotline
0800 212 506 /021 406 6782
Alternatively "WhatsApp" or send an SMS or "Please Call Me" to 071 840 1572
www.mic.uct.ac.za

Based on the 2024 NDoH Management of Tuberculosis in Children and Adolescents: A Clinical Guideline For The Diagnosis and Treatment of Drug-susceptible TB in Children and Adolescents in South Africa, September 2024

Published April 2025, version 2

2024 TB DRUG DOSING CHART FOR CHILDREN / ADOLESCENTS <15 YEARS

WITH CONFIRMED/PRESUMED DRUG-SUSCEPTIBLE TB MENINGITIS / CENTRAL NERVOUS SYSTEM (CNS) TB / MILIARY TB

Single phase of treatment: 6-9 months
Once daily, 7 days a week

Target dose range & maximum doses	Isoniazid (H): 15-20 mg/kg, maximum dose 450 mg Rifampicin (R): 22.5-30 mg/kg, maximum dose 900 mg	Pyrazinamide (Z): 35-45 mg/kg, maximum dose 2 g	Ethionamide (Eto): 17.5-22.5 mg/kg, maximum dose 1 g	Target dose range & maximum doses
Formulation **Body weight (kg)**	**HR** **50/75 mg dispersible tablet (scored)** **OR** **50/75 mg/4 ml suspension[3]**	**Z** **500 mg tablet (scored)** **OR** **500 mg/8 ml suspension [4]**	**Eto** **250 mg tablet (not scored)** **OR** **250 mg/8 ml suspension [5]**	**Formulation** **Body weight (kg)**
<2	Obtain expert advice			**<2**
2 – 2.9	¾ tablet (3 ml) [3]	1 ml	1.5 ml	**2 – 2.9**
3 – 3.9	1 ½ tablets	2 ml	2 ml	**3 – 3.9**
4 – 4.9	**<3 months**: 1 ½ tablets **≥3 months**: 2 tablets	2.5 ml	2.5 ml	**4 – 4.9**
5 – 5.9	2 ½ tablets	3 ml	3 ml	**5 – 5.9**
6 – 7.9	3 tablets	½ tablet or 4 ml	½ tablet or 4 ml	**6 – 7.9**
8 – 8.9	3 ½ tablets			**8 – 8.9**
9 – 9.9		¾ tablet or 6 ml	¾ tablet or 6 ml	**9 – 9.9**
10 – 11.9	4 tablets			**10 – 11.9**
12 – 12.9		1 tablet or 8 ml	1 tablet or 8 ml	**12 – 12.9**
13 – 14.9	4 ½ tablets			**13 – 14.9**
15 – 15.9	5 tablets		1 ¼ tablets or 10 ml	**15 – 15.9**
16 – 16.9	6 tablets			**16 – 16.9**
17 – 17.9		1 ¼ tablets or 10 ml		**17 – 17.9**
18 – 19.9			1 ½ tablets or 12 ml	**18 – 19.9**
20 – 24.9	7 tablets	1 ½ tablets		**20 – 24.9**
25 – 29.9	**HR** **150/300 mg tablet** 3 tablets	2 tablets	2 tablets or 16 ml	**25 – 29.9**
30 – 34.9		2 ½ tablets	2 ½ tablets or 20 ml	**30 – 34.9**
35 – 39.9		3 tablets	3 tablets or 24 ml	**35 – 39.9**
40 – 49.9		3 ½ tablets	3 ½ tablets or 28 ml	**40 – 49.9**
≥50		4 tablets	4 tablets or 32 ml	**≥50**

CHILDREN SHOULD BE TAUGHT AND ENCOURAGED TO SWALLOW WHOLE TABLETS OR, IF REQUIRED, FRACTIONS OF TABLETS TO AVOID LARGE VOLUMES OF LIQUID MEDICATION

[3] To make an oral suspension for weight band 2 - 2.9 kg, for each dose, disperse 1 x HR 50/75 mg tablet in **4 ml** of water, administer 3 ml, discard unused suspension. For other weight bands, an oral suspension can be made by dispersing the required number of tablets & fractions of tablets in a small amount of water (5-10 ml) and administering all of the suspension to the child orally or via nasogastric tube.

[4] To make an oral suspension, crush 1 x 500 mg pyrazinamide tablet to a fine powder, disperse in **8 ml** water to prepare a concentration of 500 mg/8 ml (62.5 mg/ml), administer required dose as indicated in above chart, discard unused suspension.

[5] To make an oral suspension, crush 1 x 250 mg ethionamide tablet to a fine powder, disperse in **8 ml** of water to prepare a concentration of 250 mg/8 ml (31.3 mg/ml), administer required dose as indicated in above chart, discard unused suspension.

NEED HELP?

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

0800 212 506 /021 406 6782

Alternatively "WhatsApp" or send an SMS or "Please Call Me" to 071 840 1572

www.mic.uct.ac.za

health
Department: Health
REPUBLIC OF SOUTH AFRICA

MEDICINES INFORMATION CENTRE

[#]DANGER SIGNS INDICATING SEVERE ILLNESS AT PRESENTATION IN CHILDREN >3 MONTHS OF AGE

Adapted from the WHO Operational handbook on TB Module 5, SA National 2022 IMCI guidelines and Chapter 15: Respiratory System of the STG and EML for paediatric hospitals in SA, 2013

General danger signs	Signs of severe respiratory illness (any)	Signs of severe dehydration (two or more)	Signs of meningitis (any)	Signs of severe anaemia (any)
• Vomiting everything • Convulsions • Unconscious or lethargic • Any signs of shock • Unable to drink/breastfeed	• Chest indrawing • Stridor in calm child • Oxygen saturation <92% in room air • Central cyanosis	• Unconscious or lethargic • Sunken eyes • Unable to drink or drinking poorly • Skin pinch goes back very slowly	• Neck stiffness • Bulging fontanelle • Restless, continuously irritable	• Severe palmar pallor • Hb <7 g/dl

IF ETHIONAMIDE STOCK IS NOT AVAILABLE

- In children with CNS TB (TB meningitis, tuberculoma, TB spine) or miliary TB, where ethionamide is not available, consult a specialist clinician to assist in choosing one of the two alternative regimens (that exclude ethionamide). Assess each case individually before selecting a regimen.
- Use these regimens for both newly diagnosed patients and those already on treatment needing a switch.
- Refer to the table below for details of the alternative regimens.

REGIMEN		NOTES
• Replacement of Ethionamide with Levofloxacin	• 6-month regimen: • RHZ + levofloxacin	• This is based on the existing 6-month regimen where ethionamide is replaced with levofloxacin and rifampicin is optimised. Note that this regimen is still investigational, so informed consent is required prior to initiation with close monitoring and follow up of patients.
• World Health Organization (WHO) • regimen	• 12 month WHO regimen: 2RHZE + 10RH	• This is the current regimen endorsed by the WHO (with dose adjustments, informed by guidance from local experts). The treatment duration is 12 months which may present a higher risk of non-completion for some patients.

REPLACEMENT OF ETHIONAMIDE WITH LEVOFLOXACIN

Body weight (kg)	Single phase of treatment, 6 months. Once daily; 7 days a week			Body weight (kg)
	Rifampicin/Isoniazid (RH)*	Pyrazinamide (Z)	Levofloxacin	
	75/50 mg dispersible tablet (scored)	*500 mg tablet (scored) **OR** 500 mg/8 mL suspension***	*250 mg tablet OR 500 mg tablet OR 25 mg/ml suspension****	
< 2	Obtain Expert Advice			< 2
2–2.9	¾ tablet or 3 mL	1 mL	2 mL	2–2.9
3–3.9	1 ½ tablet or 6 mL	2 mL	3 mL	3–3.9
4–4.9	< 3 months: 1 ½ tablets or 6 mL ≥ 3 months: 2 tablets or 8 mL	2.5 mL	4 mL	4–4.9
5–5.9	2 ½ tablets or 10 mL	3 mL	5 mL or ½ x 250 mg tablet	5–5.9
6–7.9	3 tablets or 12 mL	½ tablet or 4 mL	6 mL	6–7.9
8–8.9	3 ½ tablets or 14 mL		7 mL	8–8.9
9–9.9		¾ tablet or 6 mL		9–9.9
10–11.9	4 tablets or 16 mL		10 mL or 1 x 250 mg tablet	10–11.9
12–12.9		1 tablet or 8 mL		12–12.9
13–14.9	4 ½ tablets or 18 mL		15 mL or 1 ½ x 250 mg tablet	13–14.9
15–15.9	5 tablets or 20 mL			15–15.9
16–16.9	6 tablets or 24 mL		1 x 500 mg tablet or 2 x 250 mg tablet or 20 mL	16–16.9
17–17.9		1¼ tablets or 10 mL		17–17.9
18–19.9				18–19.9
20–24.9	7 tablets or 28 mL	1 ½ tablets or 12 mL		20–24.9
25-29.9	*Choose one option*	2 tablets or 16 mL	1 ½ x 500mg or 3 x 250mg tablets daily	25-29.9
30-34.9	*RH 150/75 mg* / *RH 300/150 mg*	2 ½ tablets or 20 mL		30-34.9
35-39.9	6 tablets / 3 tablets	3 tablets or 24 mL	2 x 500mg or 4 x 250 mg tablets daily	35-39.9
40-49.9		3.5 tablets or 28 mL		40-49.9
≥ 50		4 tablets or 32 mL		≥ 50

*If oral suspension required, for each dose, disperse 1 x RH 75/50 mg tablet in 4 mL of water, administer required dose as indicated in above chart, discard unused suspension.
**If oral suspension is required, crush 1 x 500 mg pyrazinamide tablet to a fine powder, disperse in 8 mL water to prepare a concentration of 500 mg/8 mL (62.5 mg/mL), administer required dose as indicated in above chart, discard unused suspension.
****For Levofloxacin 25mg/ml suspension: Crush and disperse 1 x 250mg tablet in 10 mL water.

IF ETHIONAMIDE IS NOT AVAILABLE

WHO REGIMEN

<table>
<tr><th rowspan="3">Body weight (kg)</th><th colspan="5">Once daily; 7 days a week</th><th rowspan="3">Body weight (kg)</th></tr>
<tr><th colspan="3">Intensive Phase (2 months)</th><th colspan="2">Continuation phase (10 months)</th></tr>
<tr><th>Rifampicin/ Isoniazid (RH)*</th><th>Pyrazinamide (Z)</th><th>Ethambutol</th><th>Rifampicin/ Isoniazid (RH)*</th></tr>
<tr><th></th><th>75/50 mg dispersible tablet (scored)</th><th>500 mg tablet (scored) OR 500 mg/8 mL suspension**</th><th>400 mg tablet OR 400 mg/8 mL solution***</th><th>75/50 mg dispersible tablet (scored)</th><th></th></tr>
<tr><td>< 2</td><td colspan="4">Obtain Expert Advice</td><td>< 2</td></tr>
<tr><td>2–2.9</td><td>¾ tablet or 3 mL</td><td>1 mL</td><td>1mL</td><td>¾ tablet or 3 mL</td><td>2–2.9</td></tr>
<tr><td>3–3.9</td><td>1½ tablets or 6 mL</td><td>2 mL</td><td>1.5mL</td><td>1½ tablets or 6 mL</td><td>3–3.9</td></tr>
<tr><td>4–4.9</td><td>< 3 months: 1 ½ tablets or 6 mL
≥ 3 months: 2 tablets or 8 mL</td><td>2.5 mL</td><td rowspan="2">2.5mL</td><td>< 3 months: 1 ½ tablets or 6 mL
≥ 3 months: 2 tablets or 8 mL</td><td>4–4.9</td></tr>
<tr><td>5–5.9</td><td>2 ½ tablets or 10 mL</td><td>3 mL</td><td>2 ½ tablets or 10 mL</td><td>5–5.9</td></tr>
<tr><td>6–7.9</td><td>3 tablets or 12 mL</td><td rowspan="2">½ tablet or 4 mL</td><td>3 tablets or 12 mL</td><td>6–7.9</td></tr>
<tr><td>8–8.9</td><td rowspan="2">3 ½ tablets or 14 mL</td><td rowspan="2">½ tablet or 4mL</td><td rowspan="2">3 ½ tablets or 14 mL</td><td>8–8.9</td></tr>
<tr><td>9–9.9</td><td rowspan="2">¾ tablet or 6 mL</td><td>9–9.9</td></tr>
<tr><td>10–11.9</td><td rowspan="2">4 tablets or 16 mL</td><td rowspan="2">4 tablets or 16 mL</td><td>10–11.9</td></tr>
<tr><td>12–12.9</td><td rowspan="3">1 tablet or 8 mL</td><td rowspan="2">¾ tablet or 6mL</td><td>12–12.9</td></tr>
<tr><td>13–14.9</td><td>4 ½ tablets or 18 mL</td><td>4 ½ tablets or 18 mL</td><td>13–14.9</td></tr>
<tr><td>15–15.9</td><td>5 tablets or 20 mL</td><td>5 tablets or 20 mL</td><td>15–15.9</td></tr>
<tr><td>16–16.9</td><td rowspan="3">6 tablets or 24 mL</td><td rowspan="3">1 tablet or 8mL</td><td rowspan="3">6 tablets or 24 mL</td><td>16–16.9</td></tr>
<tr><td>17–17.9</td><td>1¼ tablets or 10 mL</td><td>17–17.9</td></tr>
<tr><td>18–19.9</td><td rowspan="2">1 ½ tablets or 12 mL</td><td>18–19.9</td></tr>
<tr><td>20–24.9</td><td>7 tablets or 28 mL</td><td>7 tablets or 28 mL</td><td>20–24.9</td></tr>
<tr><td>25-29.9</td><td colspan="2">Choose one option</td><td>2 tablets or 16 mL</td><td>1 ½ tablets or 12 mL</td><td colspan="2">Choose one option</td><td>25-29.9</td></tr>
<tr><td>30-34.9</td><td>RH 150/75 mg</td><td>RH 300/150 mg</td><td>2 ½ tablets or 20 mL</td><td>RH 150/75 mg</td><td>RH 300/150 mg</td><td>30-34.9</td></tr>
<tr><td>35-39.9</td><td rowspan="4">6 tablets</td><td rowspan="4">3 tablets</td><td>3 tablets or 24 mL</td><td>2 tablets or 16 mL</td><td rowspan="4">6 tablets</td><td rowspan="4">3 tablets</td><td>35-39.9</td></tr>
<tr><td>40-42.9</td><td>3 ½ tablets or 28 mL</td><td rowspan="2">2 ½ tablets or 20 mL</td><td>40-42.9</td></tr>
<tr><td>43-49.9</td><td rowspan="2">4 tablets or 32 mL</td><td>43-49.9</td></tr>
<tr><td>≥ 50</td><td>≥ 50</td></tr>
</table>

*If oral suspension required, for each dose, disperse 1 x RH 75/50 mg tablet in 4 mL of water, administer required dose as indicated in above chart, discard unused suspension.
**If oral suspension is required, crush 1 x 500 mg pyrazinamide tablet to a fine powder, disperse in 8 mL water to prepare a concentration of 500 mg/8 mL (62.5 mg/mL), administer required dose as indicated in above chart, discard unused suspension.
***For ethambutol suspension, crush 1 tablet (400mg) to a fine powder and dissolve in 8ml of water to prepare a concentration of 400mg/8mL (or 50mg/mL). Give the child the required dose as indicated in the chart above and discard unused suspension.

Section 4

RR-TB treatment

INITIATING RR-TB TREATMENT IN CHILDREN < 15 YEARS

- Child's TB NAAT (e.g., Xpert) or culture has reported a rifampicin-resistant result *OR*
- Child has a RR-TB contact, and has been evaluated to have TB based on a combination of signs, symptoms, CXR or imaging and/or other diagnostic testing

Children of any age with RR-TB may be managed at any facility that manages adults with RR-TB. Refer to centralised sites or discuss with a paediatric expert if needed.

↓

Do baseline observations, examination, bloods, sputum, ECG and chest x-ray, if not already done (p38).

↓

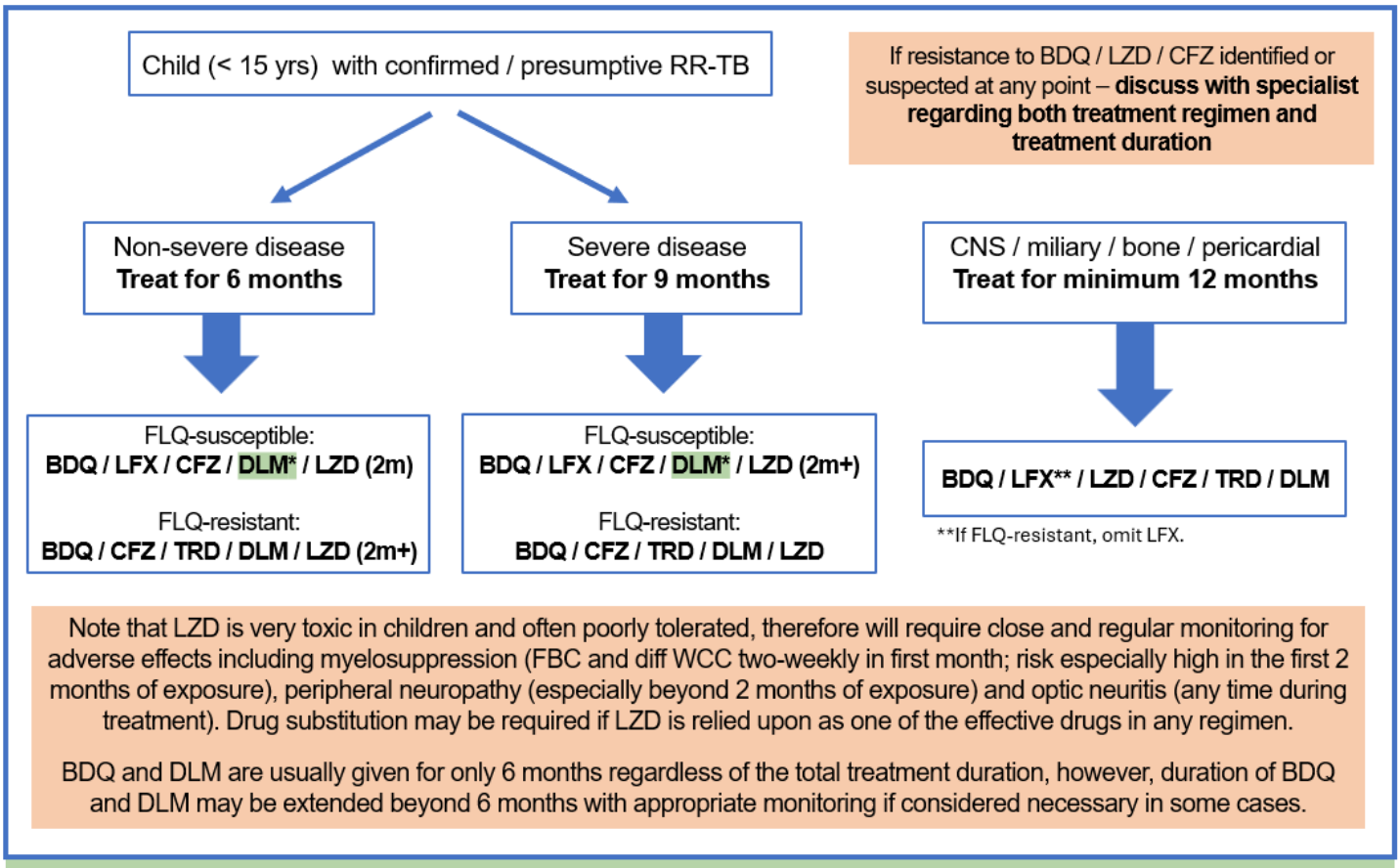
Manage further according to severity of disease and drug susceptibility (this may be the child's DST results *or* the close contacts DST results).

↓

Determine if disease is non-severe or severe:

NON-SEVERE	SEVERE
• CXR: unilateral disease (consolidation, infiltrates in < 1 lobe) without cavities • Mediastinal lymph nodes without airways compression • Peripheral lymphadenopathy • Simple pleural effusions	• CXR: bilateral disease or ≥ 1 lobe involved (consolidation, infiltrates), or presence of cavities • Mediastinal lymph nodes causing airways compression • Extrapulmonary forms of disease other than peripheral LNs or simple pleural effusion

Figure 3.1: Approach to treatment of RR-TB in children < 15 years *(Section 3 of the 2023 RR-TB Guidelines)*



*Children treated for FLQ-susceptible RR-TB should be offered delamanid as the preferred choice over terizidone. Terizidone may be used in replacement of delamanid.

BASELINE AND FOLLOW UP OBSERVATIONS AND TESTS

	BASELINE	AT 2 WEEKS	AT 4 WEEKS AND THEN MONTHLY	COMMENTS
OBSERVATIONS, AND EXAMINATION	Weight and height (plot WFH)	Weight	Weight	Check that child is consistently gaining weight and improving clinically.
	Ask about symptoms and record significant examination findings	Ask about symptoms and side effects and record significant examination findings	Ask about symptoms and record significant examination findings	
	Pulse rate	Pulse rate	Pulse rate	
	Sats	Sats	Sats	
	Screen for peripheral neuropathy	-	**If on Lzd:** screen for peripheral neuropathy	
BEDSIDE TESTS	HIV test	-	-	Ensure HIV status known
	Hb	-	-	Screen for anaemia – discuss with specialist before starting Lzd if Hb < 10g/dL in child < 5 years old, or Hb < 11g/dL in child ≥ 5 years old.
	Visual screen	-	**If on Lzd:** visual screen	If change in vision, refer.
	ECG (calculate QTcF* interval, see below)	-	If on Bdq, Cfz, Mfx, or Dlm: ECG	Monitor for QT prolongation - discuss with specialist same day.
BLOOD TESTS	FBC and differential WCC	**If on Lzd:** FBC + diff WCC	**If on Lzd:** FBC + diff WCC	Watch for bone marrow toxicity (anaemia, thrombocytopenia, neutropenia).
	ALT	-	-	Refer to table on p41.
	If starting on PAS: TSH	-	-	Monitor for hypothyroidism.
	If CLHIV: CD4 and VL	-	-	
SPUTUM ***Only repeat monthly sputums if child old enough to expectorate.***	• If culture positive, laboratory will do DR-TB reflex DST. • If culture not done, send a new sputum specimen for DR-TB reflex DST.	-	• Follow up genotypic and phenotypic DST results of child and source case at every visit • If able, repeat sputum for TB culture.	• Adjust regimen if needed. • If month 4 culture still positive, present to PCAC. • If culture becomes positive after being negative, present to NCAC.
CHEST X-RAY	If not done already, arrange for a chest x-ray AP/PA and lateral.	-	Consider repeat CXR at 3 months or if clinically not improving.	If chest x-ray worse despite treatment, discuss with specialist.

How to determine the QTcF *(QT corrected for heart rate using Fridericia's formula)*

The commonly used threshold for QTc prolongation in children is:

- If QTc > 450 ms and child has symptoms (dizziness, palpitations, chest pain, faintness), refer to hospital.
- QTc 450-470 ms = if asymptomatic, continue routine monitoring.
- QTc > 470 ms = repeat ECG at rest same day, check TSH and electrolytes, review other medications for QT prolongation and discuss same day.

To access an online QTc interval calculator: scan the QR code or click the link below:
https://www.mdcalc.com/calc/48/corrected-qt-interval-qtc

PRINCIPLES OF INDIVIDUALISED RR-TB REGIMENS

In consultation with an experienced RR-TB clinician, choose an individualised RR-TB regimen, designed according to WHO grouping - using the following rules:

RULE 1: Base regimen on known DST pattern.
RULE 2: Aim to use at least 4 effective medicines (preferably 5) in 'intensive phase'; and 3 effective drugs (preferably 4) in the 'continuation phase'.
RULE 3: Use as many Group A medicines as possible; and the rest from Group B. Only use Group C medicines if unable to build an effective regimen from Group A and Group B drugs.
RULE 4: Adjust regimen once further DST results become available later.
RULE 5: If adverse effects make the regimen difficult to tolerate, adjust again taking rule 6 into account.
RULE 6: Never add just 1 medicine to a failing regimen – a failing regimen needs expert discussion (new regimen).

WHO MEDICINE GROUPINGS RECOMMENDED FOR USE IN THE LONGER RR-TB REGIMENS

GROUPS AND STEPS	MEDICINE	ABBREVIATION	COMMENTS
Group A: Include all 3 medicines	Levofloxacin* (or Moxifloxacin*)	Lfx or Mfx	Include for CNS disease. Omit in fluoroquinolone-resistant RR-TB.
	Bedaquiline*	Bdq	Include if no resistance. If resistant to Bdq, there is a high rate (90%) cross resistance with Cfz.
	Linezolid*	Lzd	Include for all including CNS disease, unless contraindication or resistance. If Hb <8 g/dL, neutrophils <0.75 x 109/L and/or platelets <50 x 109/L, only consider reintroducing or initiating in hospital under close monitoring.
Group B: Add one or both medicines	Clofazimine*	Cfz	High cross resistance (90%) if resistance to bedaquiline.
	Terizidone	Trd	Include for CNS disease.
Group C: Add to complete the regimen and when medicines from Groups A and B cannot be used	Ethambutol**	E	Only use as a reliably effective drug if susceptibility demonstrated on DST (not routinely tested for)
	Delamanid*	Dlm	Include for CNS disease. Some cross resistance with pretomanid.
	Pyrazinamide**	Z	Include for CNS disease. Only use as a reliably effective drug if susceptibility demonstrated on DST.
	Imipenem-cilastatin or meropenem or ertapenem	Ipm-Cln or Mpm or ETP	Given IV - this is a barrier. Adequate CNS penetration. Must be given in combination with amoxicillin/clavulanic acid.
	Amikacin (or Streptomycin)	Am or (S)	Given IV/IM. Administer if not enough other drug options to compose an effective regimen. Only administer if there is documented susceptibility, if formal hearing tests can be done, and if the patient consents to its use after the risks and benefits of the drug have been explained. Therapeutic drug monitoring must be done.
	Ethionamide** or prothionomide	Eto or Pto	Consider for CNS disease. Do not give if inhA mutation present.
	P-aminosalicylic acid	PAS	Use in rescue regimens.

* Child-friendly formulations available | ** Can crush and mix.

Western Cape Government FOR YOU

DRUG-RESISTANT-TB TREATMENT DOSING TABLE FOR CHILDREN 2024

(< 46 kg and < 15 years)

MEDICINES INFORMATION CENTRE

	WHO Group A									WHO Group B			
	Levofloxacin (LFX) (preferred quinolone)		**Moxifloxacin (MFX)**	**Bedaquiline (BDQ)**		**Linezolid (LZD)**			**Terizidone (TRD)#**	**Clofazimine (CFZ)**		
Formulations	100 mg DT** **OR** 10 mg/mL suspension	250 mg tablet **OR** 500 mg tablet **OR** 25 mg/mL suspension	400 mg tablet	20 mg DT	100 mg tab **OR** 10 mg/mL suspension	20 mg/mL suspension	150 mg DT** **OR** 15 mg/mL suspension	600 mg tablet **OR** 60 mg/mL suspension	250 mg capsule	50 mg DT** **OR** 5 mg/mL suspension	100 mg gel capsule	**Formulations**
Target dose	15 - 20 mg/kg/day		10 - 15 mg/kg/day	Once daily loading dose for 14 days then thrice weekly (TIW) dosing M/W/F		1 - 15 kg: 15 mg/kg daily; ≥ 15 kg: 10-12 mg/kg daily			7 - 29.9 kg: 15 - 20 mg/kg; ≥ 30 kg: 10 - 15 mg/kg	2 - 5 mg/kg when given daily		**Target dose**
MDD	1.5 g		400 mg	Loading dose: 400 mg daily; Maintenance dose: 200 mg M/W/F		600 mg			750 mg	100 mg		**MDD**
Practical advice	In general, for older children able to swallow tablets/capsules whole, avoid crushing and mixing tablets/capsules with water, as this may reduce palatability (tastes worse than swallowing tablets whole). Discard any unused portion of a non-commercial solution. Dispersible tablets (DT) can either be dispersed in a liquid or mixed with a soft or semi-soft food such as a spoonful of yoghurt or porridge.											**Practical advice**
	For a 10 mg/mL suspension: crush and disperse 1 x 100 mg DT in 10 mL water	For a 25 mg/mL suspension: crush and disperse 1 x 250 mg tablet in 10 mL water	For 40 mg/mL suspension: crush and disperse 1 x 400 mg tablet in 10 mL water	A daily loading dose for 2 weeks, followed by a maintenance dose given three times a week for 22 weeks. If treatment is interrupted see Table on Bedaquiline interruptions on next page for guidance on reloading. For 10 mg/mL suspension: Crush and disperse 1 x 100 mg tablet in 10 mL water. Vigorous stirring/shaking is needed prior to administering the 100 mg tablet crushed and suspended in water		Once reconstituted, must be used within 21 days	For 15 mg/mL suspension: crush and disperse 1 x 150 mg DT in 10 mL water	For 60 mg/mL suspension: crush and disperse 1 x 600 mg tablet in 10 mL water	For 25 mg/mL suspension: Open capsule and mix contents with 10 mL water	The 50 mg DT is preferred for children < 24 kg. For 5 mg/mL suspension: crush and disperse 1 x 50 mg DT in 10 mL water	Dosing interval changes as weight of child increases. Soften 1 x 100 mg capsule in 10mL of water or yoghurt and administer entire volume¥	
Wt. (kg)	Consult with a clinician experienced with DR-TB prescribing for children weighing < 5 kg. Refer to adult guidelines in children > 46 kg and > 15 years of age											**Wt. (kg)**
				20 mg DT		**100 mg tab OR 10 mg/mL solution**						
				Loading dose daily for 2 weeks	**Maintenance dose M/W/F for 22 weeks**	**Loading dose daily for 2 weeks**	**Maintenance dose M/W/F for 22 weeks**					
3 - 4.9	5 mL **OR** 0.5 x 100 mg DT daily	2 mL daily	1 mL daily	< 3 months: 1.5 x 20 mg DT daily ≥ 3 months: 3 x 20 mg DT daily	< 3 months: 0.5 x 20 mg DT M/W/F ≥ 3 months: 1 x 20 mg DT M/W/F	< 3 months: 3 mL daily ≥ 3 months: 6 mL daily	< 3 months: 1 mL M/W/F ≥ 3 months: 2 mL M/W/F	2 mL daily	2.5 mL daily		1 mL daily	2 - 4 mL daily		**3 - 4.9**
5 - 6.9	1 x 100 mg DT daily	5 mL **OR** 0.5 x 250 mg tab daily	2 mL daily					4 mL daily	5 mL **OR** 0.5 x 150 mg DT daily	1.25 mL daily	2 mL daily	5 mL daily	1 x 100 mg cap M/F	**5 - 6.9**
7 - 9.9	1.5 x 100 mg DT daily		3 mL daily	< 3 months: 1.5 x 20 mg DT daily 3 to < 6 months: 3 x 20 mg DT daily ≥ 6 months: 4 x 20 mg DT daily	< 3 months: 0.5 x 20 mg DT M/W/F 3 to < 6 months: 1 x 20 mg DT M/W/F ≥ 6 months: 2 x 20 mg DT M/W/F	< 3 months: 3 mL daily 3 to < 6 months: 6 mL daily ≥ 6 months: 8 mL daily	< 3 months: 1 mL M/W/F 3 to < 6 months: 2 mL M/W/F ≥ 6 months: 4 mL M/W/F	6 mL daily	1 x 150 mg DT daily	2.5 mL daily	5 mL daily		**7 - 9.9**
10 - 15.9	2 x 100 mg DT daily	1 x 250 mg tab daily	5 mL daily **OR** 0.5 x 400 mg tab	3 to < 6 months: 3 x 20 mg DT daily ≥ 6 months: 6 x 20 mg DT daily	3 to < 6 months: 1 x 20 mg DT M/W/F ≥ 6 months: 3 x 20 mg DT M/W/F	3 to < 6 months: 6 mL daily ≥ 6 months: 12 mL daily[Δ]	3 to < 6 months: 2 mL M/W/F ≥ 6 months: 6 mL M/W/F	8 mL daily			1 x 250 mg cap daily	1 x 50 mg DT daily	1 x 100 mg cap M/W/F	**10 - 15.9**
16 - 23.9	3 x 100 mg DT daily	1.5 x 250 mg tab daily	7.5 mL daily	10 x 20 mg DT daily	5 x 20 mg DT M/W/F	2 x 100 mg tabs daily	1 x 100 mg tab M/W/F	11 mL daily	2 x 150 mg DT daily[##]	5 mL daily **OR** 0.5 x 600 mg tab daily	2 x 250 mg caps daily			**16 - 23.9**
24 - 29.9	5 x 100 mg DT daily	2 x 250 mg tab daily **OR** 1 x 500 mg tab daily	1 x 400 mg tab daily					14 mL daily				2 x 50 mg DT daily	1 x 100 mg cap daily	**24 - 29.9**
30 - 35.9		1.5 x 500 mg tab **OR** 3 x 250 mg tabs daily		20 x 20 mg DT daily	10 x 20 mg DT M/W/F	4 x 100 mg tabs daily	2 x 100 mg tabs M/W/F	15 mL daily						**30 - 35.9**
36 - 45.9								20 mL daily	3 x 150 mg DT daily	7.5 mL daily				**36 - 45.9**

**Only available via Section 21. Not available at all facilities; ¥If there are any administration difficulties, consult with a TB hospital; [Δ] Use 2 x 100 mg tabs in 20 mL water, and give 12 mL. Discard the rest; #hdINH and TRD: Only to be co-administered after consultation with an expert; Add pyridoxine when INH or TRD is prescribed—see dosing under hdINH; ##For weight band 16 - 23.9 kg: Clinicians may opt to administer 1.5 x 150 mg DT or 4 mL of the 60 mg/mL solution to ensure the dose does not exceed 10 - 12 mg/kg; cap = capsule; DT = dispersible tablet; M/W/F = administer medicines three times a week on a Monday, Wednesday and Friday; tab = tablet; MDD = maximum daily dose; TIW = three times a week

	WHO Group C						Other medicines		
	Delamanid (Dlm)		Ethionamide (Eto)	Para-aminosalicylic acid (PAS)[##]	Meropenem[†] + Amoxicillin/clavulanate		High-dose isoniazid (hdINH)[#]		
Formula-tions	25 mg DT[**]	50 mg tablet **OR** 5 mg/mL suspension	250 mg tablet **OR** 25 mg/mL suspension	4 g sachet with powder for oral solution	500 mg per vial (10 mL) 1 g powder per vial (20 mL)	250 mg / 62.5 mg in 5 mL suspension 250 / 125 mg tablet	100 mg tablet **OR** 10 mg/mL suspension	300 mg tablet	Formula-tions
Target dose	3 - 4 mg/kg/day		15 - 20 mg/kg/day	200 - 300 mg/kg/day	20 - 40 mg/kg IV every 8h	To be used with meropenem	15 - 20 mg/kg/day		Target dose
MDD	100 mg twice daily		1 g	8 g	2 g twice daily	250 / 125 mg three times a day	600 mg		MDD
Practical advice	Discard any unused portion of a non-commercial solution. Dispersible tablets (DT) can either be dispersed in a liquid or mixed with a spoonful of soft or semi-soft food such as yoghurt or porridge.								Practical advice
	< 3 months: daily dosing ≥ 3 months: twice daily dosing	< 3 months: daily dosing ≥ 3 months: twice daily dosing; For 5 mg/mL suspension: disperse 1 x 50 mg in 10 mL water	For a 25 mg/mL suspension: Crush and disperse 1 x 250 mg tablet in 10 mL water	Mix one sachet with 100 mL boiled and cooled water (or juice), and give the correct volume. Take after a meal. Ensure water is at room temperature before mixing. Use reconstituted product immediately, discard the rest	Intravenous administration (only to be used with clavulanate)	To be given with each dose of the carbapenem. Oral administration, 30 min before IV meropenem. Dosing expressed as clavulanate. Once reconstituted, must be used within 7 days (confirm with specific product information)	For 10 mg/mL suspension: crush and disperse 1 x 100 mg tablet in 10 mL water Pyridoxine (vitamin b6) 1-2 mg/kg/day is always given with high dose INH: < 6 kg: 6.25 mg/d (¼ x 25 mg tablet); ≥ 6 kg but < 5 years: 12.5 mg/d; ≥ 5 year: 25 mg/d		
Wt. (kg)	Consult with a clinician experienced with DR-TB prescribing for children weighing < 5 kg. Refer to adult guidelines in children > 46 kg and > 15 years of age								Wt. (kg)
3 - 4.9	1 x 25 mg DT daily	5 mL **OR** 0.5 x 50 mg tab daily	Consult with experienced clinician	300 mg (7.5 mL) twice daily	50 mg (1 mL) IV three times a day	18.75 mg (1.5 mL) three times a day	5 mL daily **OR** 0.5 x 100 mg tab daily		3 - 4.9
5 - 6.9	< 3 months: 1 x 25 mg DT daily; ≥ 3 months: 1 x 25 mg DT twice daily	< 3 months: 5 mL **OR** 0.5 x 50 mg tab daily; ≥ 3 months: 5 mL **OR** 0.5 x 50 mg tab twice daily	3 mL daily	750 mg (18.5 mL) twice daily	100 mg (2 mL) IV three times a day	25 mg (2 mL) three times a day	1 x 100 mg tab daily		5 - 6.9
7 - 9.9			5 mL daily **OR** 0.5 x 250 mg tab daily	1000 mg (25 mL) twice daily	200 mg (4 mL) IV three times a day	37.5 mg (3 mL) three times a day	1.5 x 100 mg tabs daily		7 - 9.9
10 - 15.9	1 x 25 mg DT twice daily	5 mL **OR** 0.5 x 50 mg tab twice daily	1 x 250 mg tab **OR** 10 mL daily	2000 mg (50 mL) twice daily	300 mg (6 mL) IV three times a day	62.5 mg (5 mL) three times a day	2 x 100 mg tabs daily		10 - 15.9
16 - 23.9	2 x 25 mg DT in the morning and 1 x 25 mg DT at night	10 mL (1 x 50 mg tab) in the morning and 5 mL (0.5 x 50 mg tab) at night	2 x 250 mg tabs daily	3000 mg (75 mL) twice daily	450 mg (9 mL) IV three times a day	100 mg (8 mL) three times a day	3 x 100 mg tabs daily	1 x 300 mg tab daily	16 - 23.9
24 - 29.9				3500 mg (87.5 mL) twice daily	550 mg (11 mL) IV three times a day	250/125 mg tab three times a day[Φ]	4 x 100 mg tabs daily	1.5 x 300 mg tabs daily	24 - 29.9
30 - 35.9	2 x 25 mg DT twice daily	1 x 50 mg tab twice daily		4000 mg (100 mL) twice daily	1 g (1 vial) three times a day IV **OR** 2 g (2 vials) twice a day IV	250/125 mg tab three times a day or twice a day according to meropenem dosing[Φ]			30 - 35.9
36 - 45.9							4.5 x 100 mg tabs daily		36 - 45.9

[##]If sodium amino salicylate 1g tablets (Monopas®), accessed via section 21, is used, consult expert on administration; [†]In consultation with an experienced clinician, other carbapenems can be considered; [Φ]Alternatively, use 10 mL of the 250/62.5 mg/5 mL syrup two to three times a day according to meropenem dosing; [#]hdINH and TRD: Only to be co-administered after consultation with an expert; Add pyridoxine when INH or TRD is prescribed; MDD = maximum daily dose; tab = tablet

MONITORING FOR ADVERSE REACTIONS TO DR-TB MEDICINES IN CHILDREN

TEST	FREQUENCY	COMMENT
FBC and differential	Baseline, at week 2 (if baseline Hb was between 8 and 10), week 4, and then monthly while on LZD	Hb < 8, neutrophils < 0.75x10^9/L or platelets < 50x10^9/L needs urgent intervention. Discuss with an expert
ECG	Baseline and at one month. Continue monthly if patient has underlying cardiac disease, when symptomatic or if required	QTcF > 450msec needs urgent intervention. Also repeat ECG after 2 weeks if >60msec difference from previous QTcF result. If still raised consult with specialist. Fridericia's formula: QTcF: QT/RR(0.33)
Peripheral neuropathy (PN)	Baseline and at every visit	Can be caused by LZD, hdINH and TZD and may be permanent. LZD-induced neuropathy can occur in the first few weeks and does not respond to pyridoxine. Discuss with an expert
Visual acuity/optic neuritis	Baseline, then monthly while on LZD	LZD can cause optic neuritis. Usually reverses on discontinuation of LZD, but if continued can cause permanent disability. Other culprits: ethambutol, rifabutin
ALT	Baseline, repeat if symptomatic for liver dysfunc-tion	Symptoms of liver toxicity include: nausea and vomiting, right upper quadrant pain and tender liver, visible jaundice, clinically unwell or any evidence of liver injury (e.g. bleeding and encephalopathy). Stop all medicines if ALT > 5 x ULN or if ALT > 3 x ULN with symptoms of liver dysfunction and discuss with an expert
K+ and Mg2+	Baseline, repeat if QTcF is prolonged or vomiting/ diarrhoea/clinically unwell	Electrolyte abnormalities should be corrected as far as possible, as they may increase the risk of QT prolongation posed by medicines such as CFZ, BDQ, MFX and Dlm
TSH	Baseline and every 2 months if treatment is planned for ≥ 6 months while on PAS and/or Eto	If TSH is increased, do free T4. Discuss deranged thyroid functions with an expert

BEDAQUILINE INTERRUPTIONS

RELOAD AS BELOW AND CONTINUE NORMAL MAINTENANCE DOSE

Duration of interruption	Instructions for reloading
< 2 weeks	No reloading needed
2 - 4 weeks	3 days 400 mg[†] bedaquiline daily
1 - 12 months	7 days 400 mg[†] bedaquiline daily
> 12 months	14 days 400 mg[†] bedaquiline daily

[†]If the patient weighs between 16 and 30 kg, reload with 200 mg daily. If patient < 16 kg, consult with an expert

NEED HELP?

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

0800 212 506 /021 406 6782

Alternatively "WhatsApp" or send an SMS or "Please Call Me" to 071 840 1572

ALT = alanine transaminase; ECG = electrocardiogram; FBC = full blood count; K^+ = potassium; Mg^{2+} = magnesium; QTc = corrected QT interval; TSH = thyroid-stimulating hormone; ULN = upper limit of normal

Western Cape Government FOR YOU · 0800 212 506 · MEDICINES INFORMATION CENTRE · Stellenbosch University iYunivesithi Universiteit

Largely based on the 2023 NDoH Clinical Management of Rifampicin-Resistant Tuberculosis—Updated Clinical Reference Guide.
Additional references available on request

Published November 2024, Version 2

Section 5

Rifampicin drug interactions

MEDICATION INTERACTIONS WITH RIFAMPICIN

Suggested dose adjustment for antiretroviral therapy in children and adolescents receiving rifampicin for TB treatment

Class	Drug	No adjustment needed •	Do not use •	Use with adjustment •	Additional information
INSTI	Dolutegravir			X	• DTG-boosting entails doubling the standard ("unboosted") dose by giving it twice daily rather than once daily. • For adolescents, the dosing frequency of DTG should be increased to 50 mg 12-hourly. If on TLD FDC, add 50 mg of DTG 12 hours after the TLD dose. • For DTG-boosting in children, please refer to the "Drug Dosing Chart" on page 34 of the 2023 ART Clinical Guideline.
	Raltegravir			X	Switching to dolutegravir is preferred.
	Cabotegravir		X		Do not use with rifampicin.
	Bictegravir		X		Do not use with rifampicin.
PI	Lopinavir/ r			X	• LPV/r tablets: Double dose lopinavir/r tablets in adolescents and children able to swallow whole LPV/r tablets • LPV/r solution or pellets or 4 in 1 (ABC/3TC/LPV/r): Super- boosting with additional ritonavir powder: maintain standard LPV/r dose but add additional ritonavir twice daily as per "Drug Dosing Chart" on page 34 of the 2023 ART Clinical Guideline
	Atazanavir/r		X		Do not use with rifampicin.
	Darunavir/ r		X		Do not use with rifampicin.
NNRTI	Efavirenz	X			• If virally suppressed on EFV when TB treatment is initiated, continue EFV until two weeks after completion of TB treatment. • If virally unsuppressed on EFV, switch to DTG.
	Nevirapine		X		• Neonates < 3 kg or < 4 weeks of age living with HIV on nevirapine-based ART should be discussed with an expert. • Breastfeeding infants on nevirapine-based VTP can stop NVP if mothers have achieved undetectable VL. • If not, discuss with an expert.
	Rilpivirine		X		Do not use with rifampicin.
All NRTIs		X			No clinically significant interactions between rifampicin and ABC, TDF, TAF, AZT, 3TC or FTC

HIV medication interactions

https://www.hiv-druginteractions.org/checker

Abbreviations: 3TC, lamivudine; ABC, abacavir; ART, antiretroviral therapy; AZT, zidovudine; CLHIV, children living with HIV; DTG, dolutegravir; EFV, efavirenz; FTC, emtricitabine; HEI, HIV-exposed infant; NNRTI, non- nucleoside reverse transcriptase inhibitor; NRTI, nucleoside reverse transcriptase inhibitor; NVP, nevirapine; PEP, post-exposure prophylaxis; PI, protease inhibitor; r, ritonavir; TAF, tenofovir alafenamide; TDF, tenofovir disoproxil fumarate, TLD, ART regimen containing tenofovir, lamivudine, dolutegravir; VTP, vertical transmission prevention; VL, viral load

Section 6

Side effects and treatment interruption

MANAGE TREATMENT SIDE EFFECTS AND ADVERSE DRUG REACTIONS

Manage side effects and adverse drug reactions

Inadequate management of side effects and adverse drug reactions are the main reason patients discontinue medications and, therefore, one of the primary reasons for treatment failure.

See details on p67 in the 2024 NDOH Management of Tuberculosis in Children and Adolescents.

Manage common mild side effects

SIDE EFFECT	RESPONSIBLE MEDICATION	MANAGEMENT
Dark or orange urine	Rifampicin	Reassure child/adolescent and family members that this is normal and to be expected while taking rifampicin. It requires no intervention.
Nausea, vomiting, abdominal pain (± jaundice)	Most TB medications	• If nausea/vomiting only after taking TB treatment without jaundice or tender/enlarged liver: advise to take treatment after eating or at night. If persists after 1 week, discuss/refer. • If jaundice or tender/enlarged liver, refer to hospital. • If persistent vomiting, refer to doctor to assess for Drug- induced Liver Injury - See details on p67 in 2024 NDOH Management of Tuberculosis in Children and Adolescents.
Tingling pain/burning or numbness of hands and feet	Isoniazid	Ensure taking pyridoxine: • < 5 years old: 12.5mg/day (½ tablet) • ≥ 5 years old: 25mg/day (1 tablet) If already on pyridoxine or not responding - discuss/refer all cases.
Change in vision	Ethambutol	Stop ethambutol and refer to eye specialist same day.

Manage drug-induced liver injury (DILI)

See details on p67 in 2024 NDOH Management of Tuberculosis in Children and Adolescents.

Manage RR-TB side effects and adverse drug reactions

For anaemia, arthralgia, anxiety, diarrhoea, electrolyte disturbances, hearing problems, hepatotoxicity, dry skin, leucoaenia, neutropaenia, nausea and vomiting, peripheral neuropathy, QT interval prolongation, rash, renal impairment, seizures, skin hyperpigmentation, thrombocytopaenia, thyroid dysfunction, visual problems:
See identification and management details on p81 – 87 in 2019 Management of Rifampicin-Resistant TB guidelines, or p37-42 in 2023 Clinical Management of Rifampicin-Resistant Tuberculosis Clinical Reference Guide.

Report Adverse Drug Reactions

Record all severe (grade 3*) and serious adverse events in the patient files and electronic registers and report:

- Med Safety app – scan the QR code to download the Med Safety App to report medication.
- Or use the website: https://primaryreporting.who-umc.org/Reporting/Reporter?OrganizationID=ZA
- Or email: adr@sahpra.org.za or if ADR reports in an e2b in an xml format: e2b@sahpra.org.za

Grade 3 - symptoms cause inability to perform usual, age appropriate, social and functional activities (e.g. going to work, shopping, cooking, using transport, hobbies)

MANAGE TREATMENT INTERRUPTION

Manage the child who interrupts DS-TB treatment
It is critically important to address the underlying reasons for treatment interruption.

TREATMENT INTERRUPTION DETAILS	MANAGEMENT
Cumulative interruption < 1 month on a 4 or 6- month regimen	Add additional doses to the end of the relevant treatment phase.
Cumulative interruption > 1 month on the 4-month regimen	Change to 6-month treatment. If the interruption is in the intensive phase, add missed doses to the end of the intensive phase and continue for 6 months in total.
Cumulative interruption > 1 month on 6-month regimen	Add missed doses to the relevant treatment phase.
Interruption ≥ 2 months consecutively on the 4 or 6-month regimen	Assign outcome as 'lost to follow-up'. Repeat full clinical assessment of the patient (including radiology and bacteriological testing if available). Discuss with a clinician experienced in child and adolescent TB whether to restart a new treatment course or monitor carefully for relapse. Factors to consider would be the clinical picture and overall adherence pattern. If unsure, restart a new treatment episode.

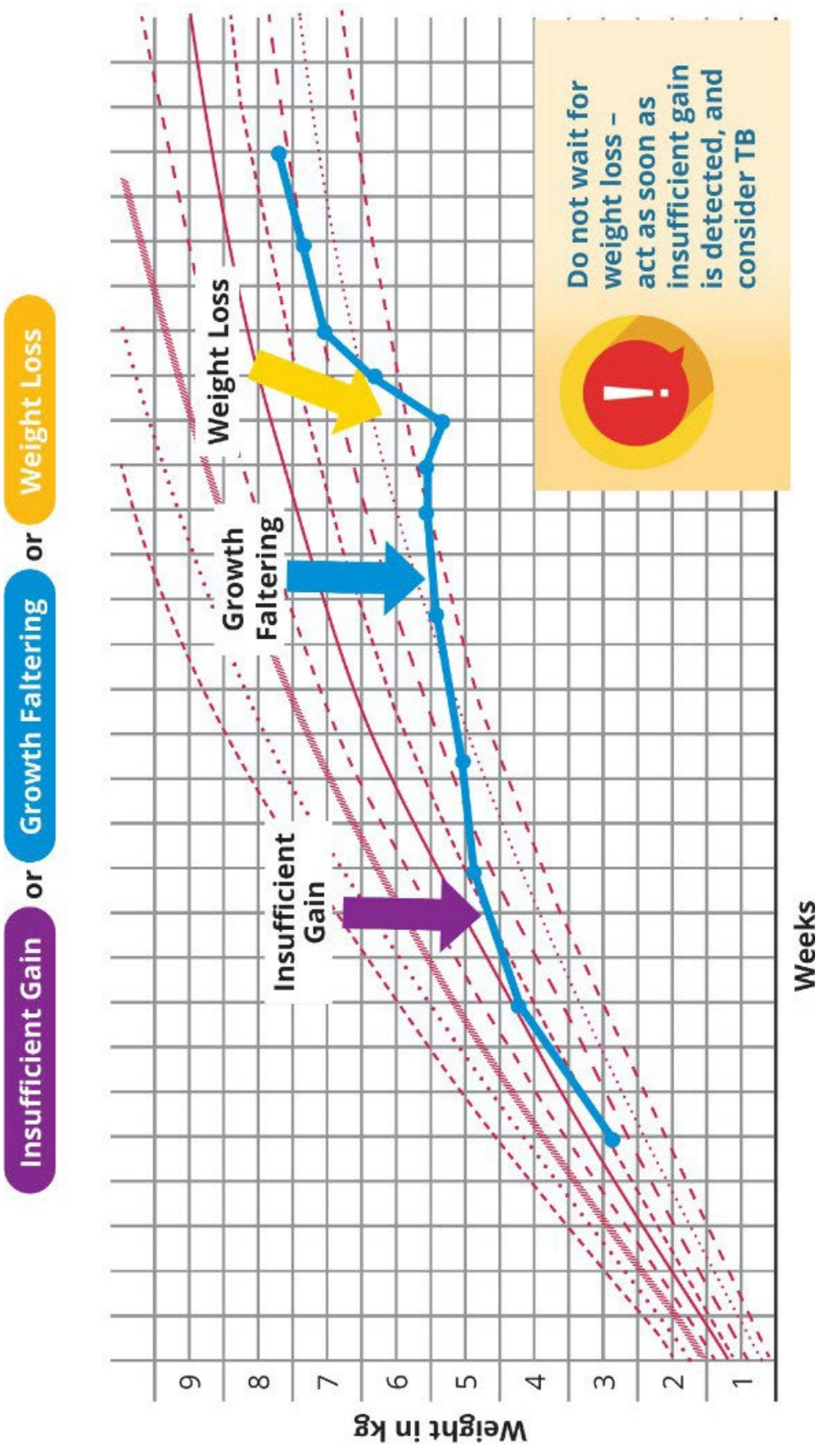
In all circumstances, if TB symptoms recur during the interruption, reassess the child or adolescent with TB NAAT and culture/DST to assess for drug resistance.

For RR-TB treatment interruption, discuss with expert.

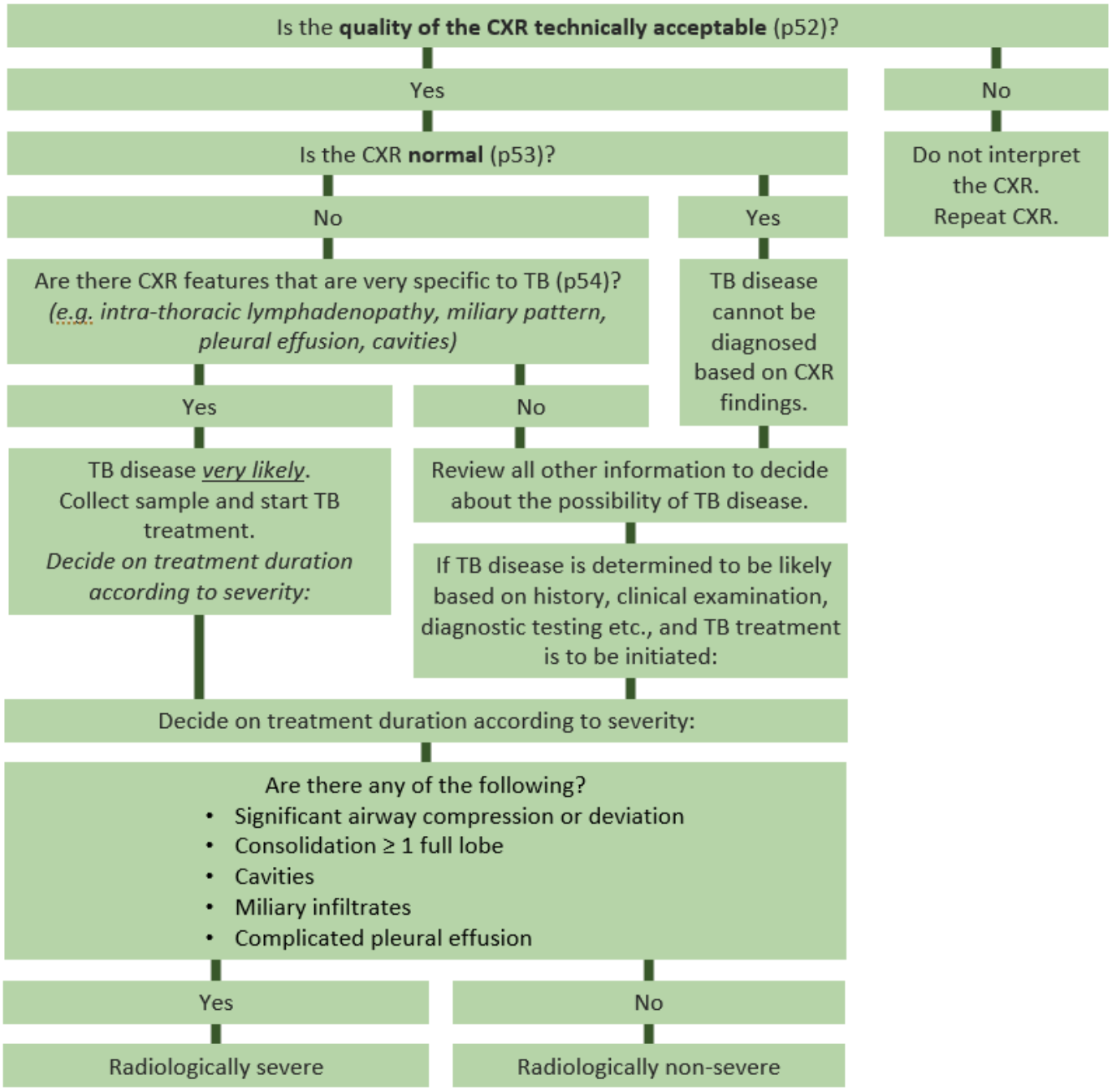
Section 7

"How to"

HOW TO IDENTIFY GROWTH FALTERING IN CHILDREN



HOW TO REVIEW A PAEDIATRIC CHEST X-RAY



The International Union Against Tuberculosis and Lung Disease (The Union) has excellent CXR resources that can be accessed at the following links:

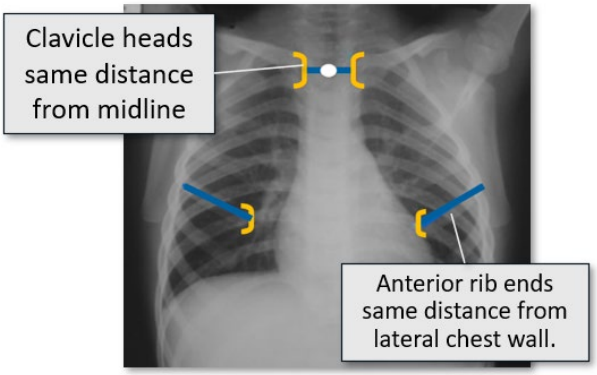
Diagnostic CXR Atlas for Tuberculosis in Children – image library
https://atlaschild.theunion.org/

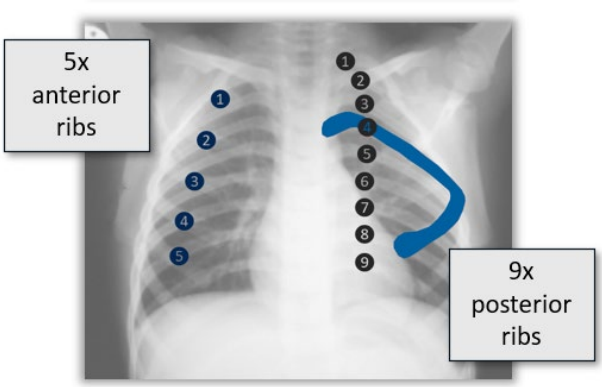
The Union Diagnostic CXR Atlas for Tuberculosis in Children
https://theunion.org/sites/default/files/2022-03/The%20Union_Diagnostic%20Atlas%20for%20TB%20in%20Children_2022.pdf

Palmer M, Seddon JA, Goussard P, Schaaf HS. Diagnostic CXR atlas for tuberculosis in children: A guide to chest X-ray interpretation, Second edition. Paris, France: International Union Against Tuberculosis and Lung Disease (The Union); 2022.

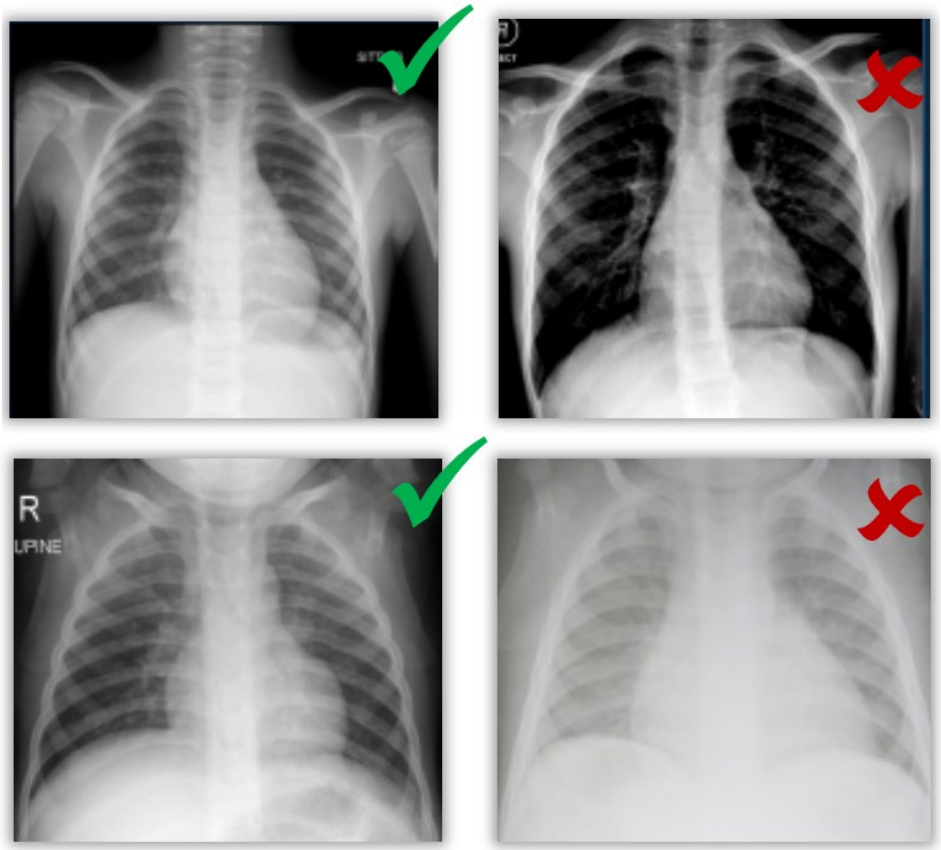
HOW TO ASSESS IF CHEST X-RAY IS TECHNICALLY ACCEPTABLE

Assess for rotation, adequate inspiration and penetration:





Rotation	Inspiration
• The CXR is not rotated if: • The two clavicle heads are the same distance from the midline (use the spinous processes of the vertebrae to identify the midline). • The anterior rib ends (more useful in children < 5 years) are the same distance from the lateral chest wall.	• The Inspiration on the CXR is adequate when: • The eight to ninth posterior ribs are visible above the diaphragm (in young children you should always count posterior ribs). • The fifth whole anterior rib is visible above the diaphragm.



Penetration

The CXR is correctly penetrated when:

- The intervertebral spaces can be seen through the heart shadow.
- The trachea and proximal bronchi are clearly visible.

Palmer M, Seddon JA, Goussard P, Schaaf HS. Diagnostic CXR atlas for tuberculosis in children: A guide to chest X-ray interpretation, Second edition. Paris, France: International Union Against Tuberculosis and Lung Disease (The Union); 2022.
Diagnostic CXR Atlas for Tuberculosis in Children – image library. Available from: https://atlaschild.theunion.org/

HOW TO EVALUATE A CHEST X-RAY

Systematically evaluate the CXR:

1. Look at the 3 structures that are white:
2. Look at the 3 structures that are black:
3. Check 3 aspects of the diaphragms and pleura

Note:

AP films are taken from younger children who are unable or unwilling to stand independently, while the standard adult PA view is taken from older children who are able to cooperate

1 3 WHITE STRUCTURES

1. Soft tissue and bone
2. Upper mediastinum
3. Heart shadow

2 3 BLACK STRUCTURES

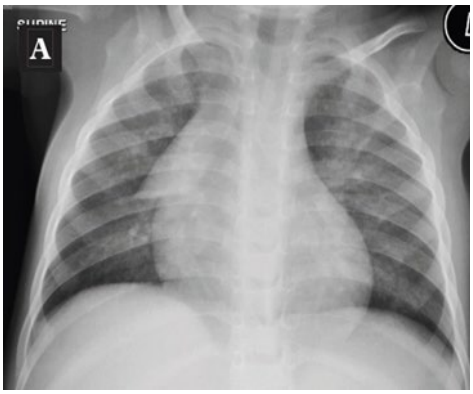
1. Trachea and bronchi
2. Right and left lung
   - » Size
   - » Hyperlucency
   - » Hilar shadows
   - » Stomach bubble

3 3 ASPECTS OF DIAPHRAGMS AND PLEURA:

1. Pleura
2. Costophrenic angles
3. Position of diaphragms

A NORMAL CHEST X-RAY

- A normal CXR does not exclude the diagnosis of TB.
- Note that the normal CXR looks different in children of different age groups

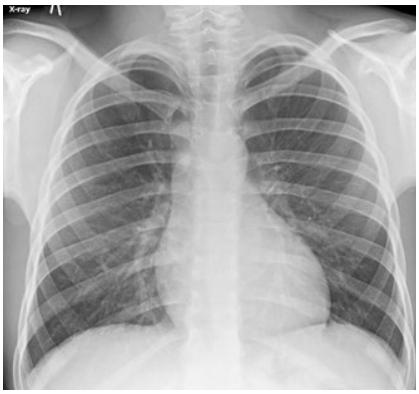


Normal AP CXR: 1 year old

Note the relatively wide mediastinum, large cardiac shadow and triangular thymic shadow

Normal AP CXR: 6 year old

Note the thymus is not visible, the mediastinum is narrower and the cardiac shadow is not as big.



Normal PA CXR: 12-year-old

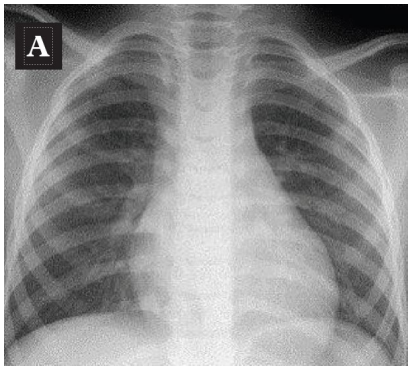
Anatomy similar to adult with narrow upper mediastinum, cardiothoracic ratio of < 50%.

Palmer M, Seddon JA, Goussard P, Schaaf HS. Diagnostic CXR atlas for tuberculosis in children: A guide to chest X-ray interpretation, Second edition. Paris, France: International Union Against Tuberculosis and Lung Disease (The Union); 2022.

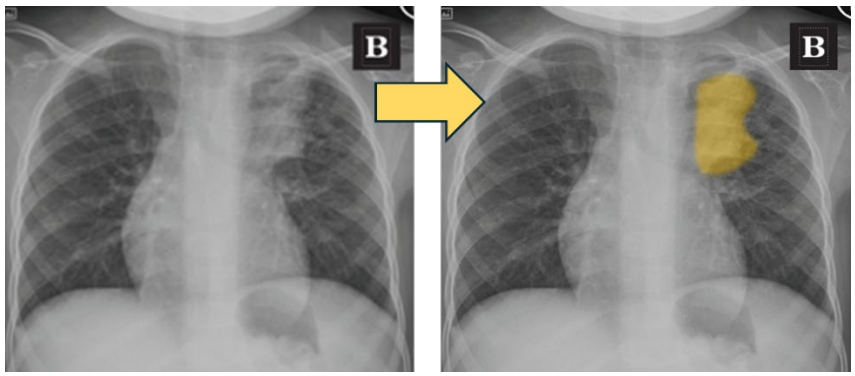
Diagnostic CXR Atlas for Tuberculosis in Children – image library. Available from: https://atlaschild.theunion.org/

HOW TO IDENTIFY FEATURES SPECIFIC TO TB ON CHEST X-RAY (1)

HILAR ADENOPATHY – PA view

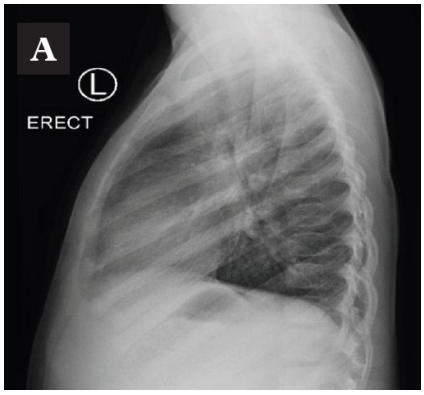


Normal PA film

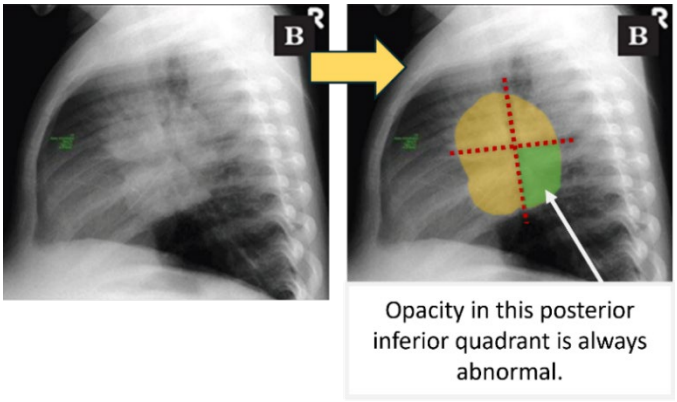


Abnormal PA film with enlarged paratracheal lymph nodes

HILAR ADENOPATHY – Lateral view

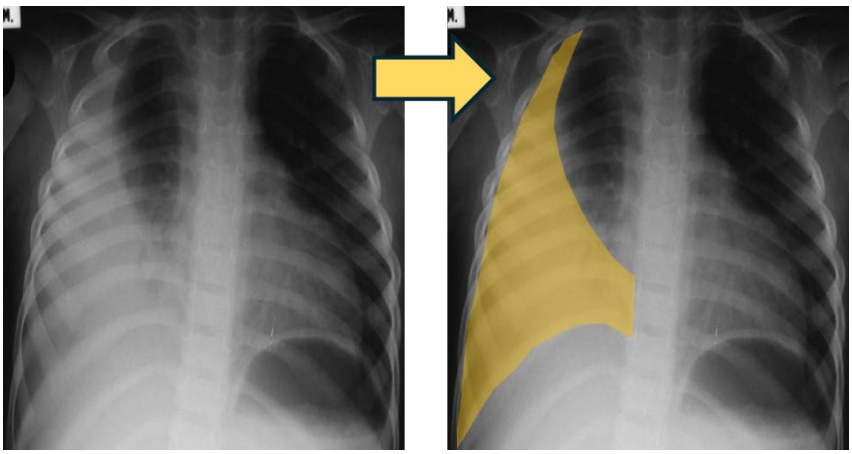


Normal lateral film



Abnormal lateral film with enlargement of the perihilar lymph nodes

PLEURAL EFFUSION – PA view



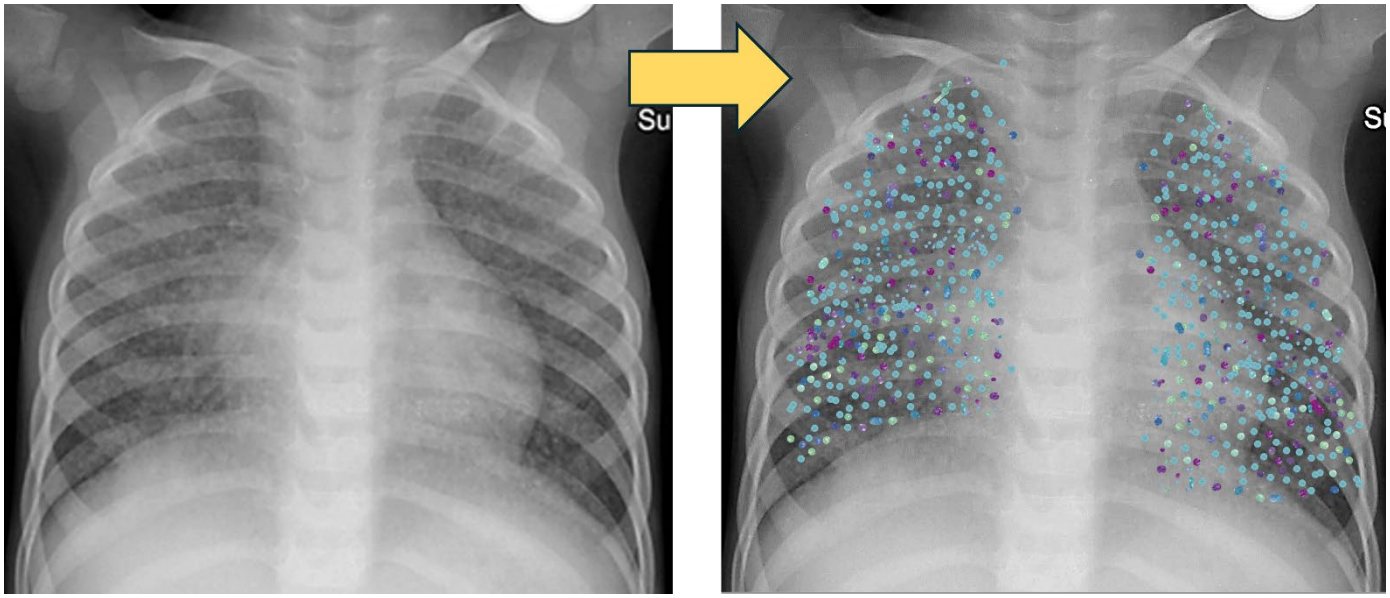
Simple right-sided pleural effusion

Palmer M, Seddon JA, Goussard P, Schaaf HS. Diagnostic CXR atlas for tuberculosis in children: A guide to chest X-ray interpretation, Second edition. Paris, France: International Union Against Tuberculosis and Lung Disease (The Union); 2022.

Diagnostic CXR Atlas for Tuberculosis in Children – image library. Available from: https://atlaschild.theunion.org/

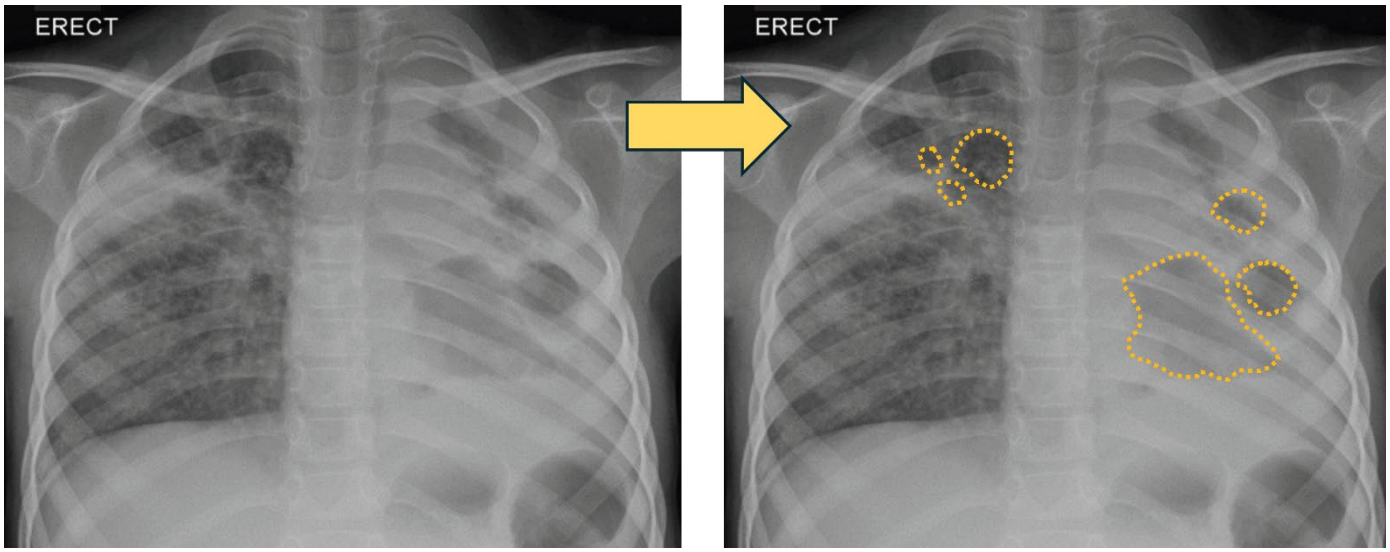
HOW TO IDENTIFY FEATURES SPECIFIC TO TB ON CHEST X-RAY (2)

MILIARY INFILTRATES – AP view



Fine nodules or small circles which look like grain or seed distributed throughout both lung fields

CAVITATORY DISEASE – PA view

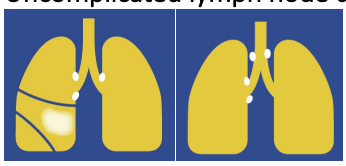
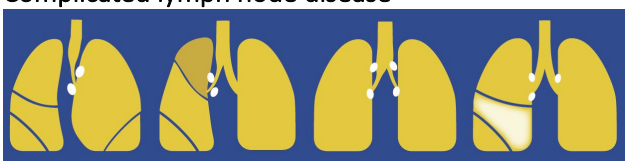
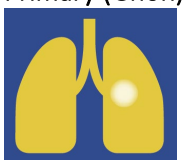
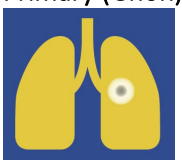
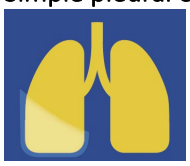
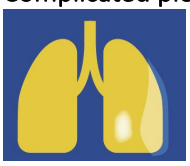
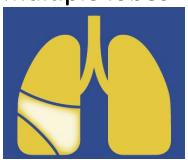
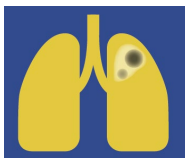
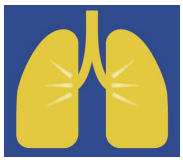
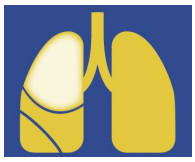
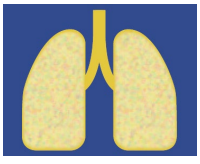
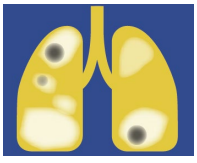


The chest x-ray shows primary progressive disease. There are widespread broncho-pneumonic infiltrates (patchy opacities) bilaterally with cavity formation

Palmer M, Seddon JA, Goussard P, Schaaf HS. Diagnostic CXR atlas for tuberculosis in children: A guide to chest X-ray interpretation, Second edition. Paris, France: International Union Against Tuberculosis and Lung Disease (The Union); 2022.

Diagnostic CXR Atlas for Tuberculosis in Children – image library. Available from: https://atlaschild.theunion.org/

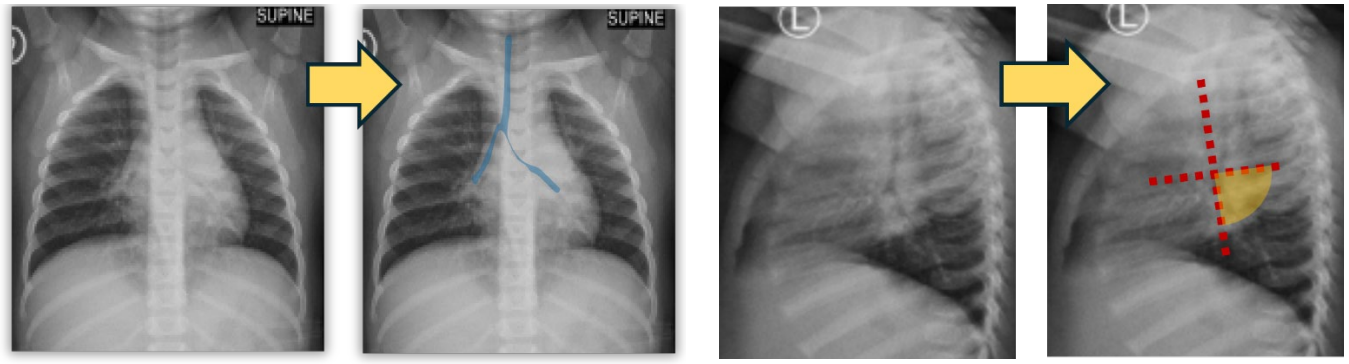
HOW TO DETERMINE RADIOLOGICAL DISEASE SEVERITY

NON-SEVERE	SEVERE
Uncomplicated lymph node disease 	Complicated lymph node disease 
Primary (Ghon) focus 	Primary (Ghon) focus with cavitation 
Simple pleural effusion 	Complicated pleural effusion 
Alveolar opacification: < 1 lobe 	Alveolar opacification: involving a whole lobe or multiple lobes 
Other:	Other:
 Interstitial pneumonia	 All cavitary disease
 Perihilar infiltrates	 Expansile pneumonia
	 Miliary TB
	 TB bronchopneumonia

Palmer M, Seddon JA, Goussard P, Schaaf HS. Diagnostic CXR atlas for tuberculosis in children: A guide to chest X-ray interpretation, Second edition. Paris, France: International Union Against Tuberculosis and Lung Disease (The Union); 2022.

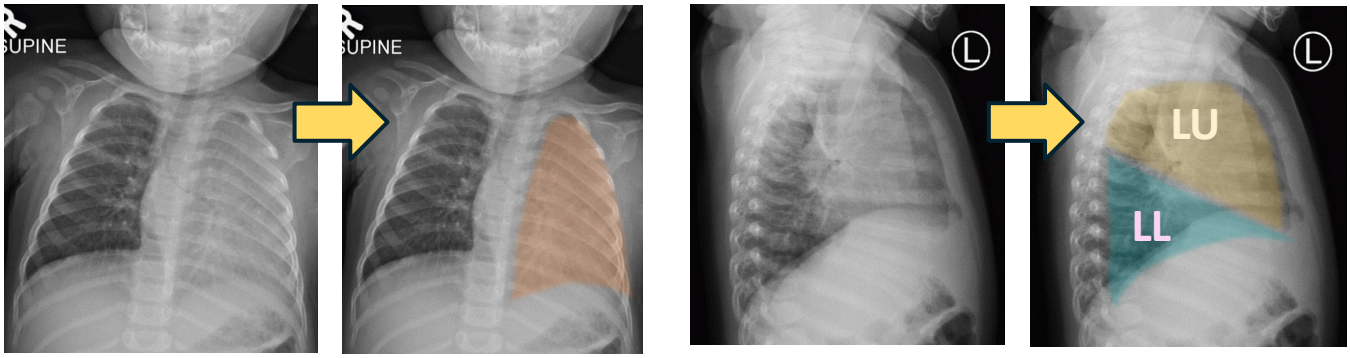
FEATURES INDICATING RADIOLOGICALLY SEVERE TB

SIGNIFICANT AIRWAY COMPRESSION OR DEVIATION



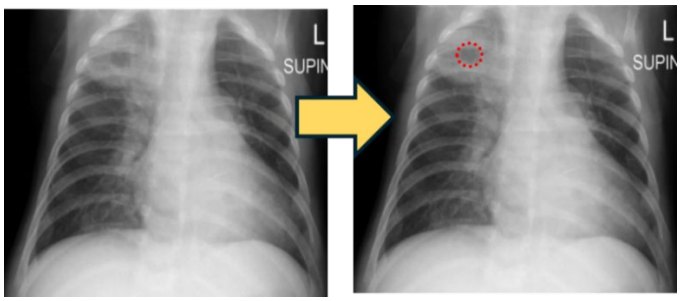
Enlarged lymph nodes are not obvious on the AP films, but there is narrowing of the left main bronchus. The enlarged lymph nodes are more apparent on the lateral film – note how the opacity on the lateral CXR includes the posterior inferior quadrant space.

CONSOLIDATION ≥ 1 FULL LOBE – PA and lateral views



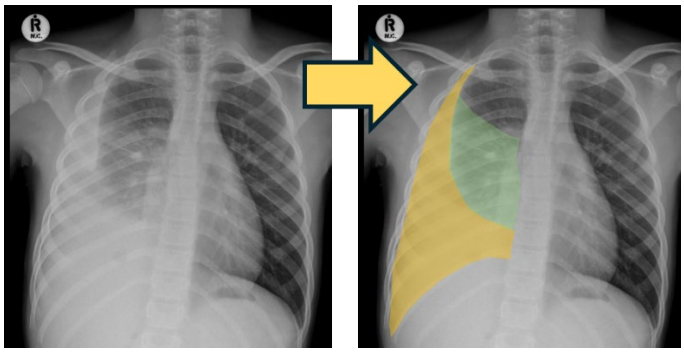
This dense consolidation of the entire left lung. The left main bronchus is narrow – this is likely caused by enlargement of perihilar and subcarinal lymph nodes (even though you cannot see the lymph nodes).

CAVITATORY DISEASE



Consolidation of the right upper lobe with breakdown and cavity formation.

COMPLICATED PLEURAL EFFUSION



Right sided pleural effusion with underlying opacification of the right lung (an effusion combined with parenchymal involvement of the lung is classified as severe disease).

MILIARY INFILTRATES – see p53.

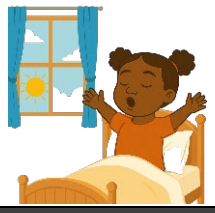
Palmer M, Seddon JA, Goussard P, Schaaf HS. Diagnostic CXR atlas for tuberculosis in children: A guide to chest X-ray interpretation, Second edition. Paris, France: International Union Against Tuberculosis and Lung Disease (The Union); 2022.

Diagnostic CXR Atlas for Tuberculosis in Children – image library. Available from: https://atlaschild.theunion.org/

HOW TO COLLECT AN ADEQUATE SPUTUM SPECIMEN IN A CHILD

IF FEASIBLE, TRY FOR AN EARLY MORNING SPECIMEN:

- If child hospitalised or if caregiver able to return a specimen to the health facility the next morning, instruct them to obtain an early morning sputum specimen, taken as the child wakes up. This improves the chance of an accurate result.
- However, if caregiver is not able to or is unlikely to return the specimen, use the current consultation opportunity to collect specimen.
- If the child has symptoms of TB, make every effort to collect a good specimen for TB testing.



PREPARE THE CAREGIVER AND THE CHILD

- Explain the procedure in simple terms to the caregiver and child, if they are old enough. Explain that a good quality sputum specimen is important to make an accurate diagnosis of TB.
- Explain that sputum is the secretion that comes from deep within the lungs and a forceful cough is needed to bring it up for collection.
- Explain that the test will not work well with saliva or nasal secretions.

PREPARE YOURSELF AND THE ENVIRONMENT

- If observing sputum collection, put on the correct personal protective equipment (PPE): gloves, respirator mask, plastic apron.
- If able, collect sputum outdoors as this significantly reduces the risk of airborne transmission. Otherwise, use a dedicated cough room with good ventilation (6-12 air exchanges/hour), or a room ventilated to the outside (i.e., open windows).

GATHER EQUIPMENT

Sputum specimen container (screw-top)

Gloves, respirator mask, apron

Laboratory request forms, pen, and specimen bags; patient stickers + barcode

Cold storage for transport

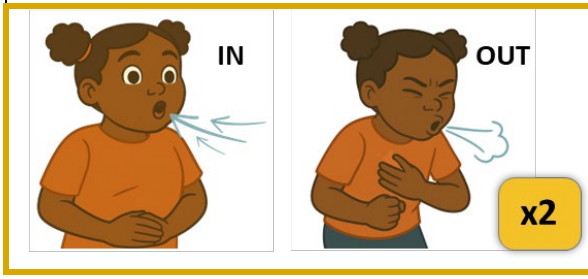
1 -+*QPREPARE THE CHILD'S MOUTH

- Ask child to rinse mouth with water to remove food, mouth wash or medication and blow their nose.

Note: the child does not need to be kept starved.

2 COLLECT THE SPUTUM SAMPLE

- Instruct child to breathe in and out deeply two times.
- Have an open specimen jar ready, avoid touching inside it.



- On the 3rd breath, instruct child to give a strong cough.
- Instruct them to repeat this until sputum is coughed up to the back of the throat. Then explain that they need to bring this forward into their mouth and spit it out into the specimen jar.

- Child may need several coughs to get at least 1-2mL.
- Aim for 2-10mL (1-2 teaspoons) sputum.

3 ENSURE THE SPECIMEN IS SAFE TO HANDLE

- Check that lid has been replaced and screwed on tightly to prevent leaking.
- Wipe down the outside of the container with alcohol swabs and allow to dry.

4 CHECK THAT THE SPECIMEN IS ADEQUATE

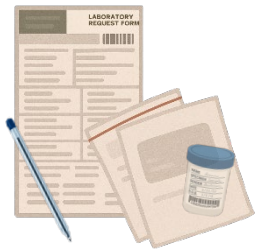
- Check if the sample is adequate:
  - » Check the volume of the specimen: at least 1-2mL of sputum must be collected. If less, ask the child to try to produce more.
  - » Check the quality of the specimen: it should be purulent, mucoid or blood stained. If watery saliva, request that child tries again.

Note: if struggling to produce sputum, consider referral to physiotherapy for support or inducing a sputum (p58).

5 LABEL THE SPECIMEN CORRECTLY

- Label the specimen with correct details or place a patient sticker on.
- Peel-off one of the pre-printed barcoded labels from the Laboratory request form and place horizontally on the specimen container.

6 PACKAGE THE SPECIMEN CORRECTLY



- Complete the laboratory request form legibly. Ensure name, surname and contact details correct.
- Place the specimen container and request form in the appropriate compartment of the specimen plastic bag.
- If room temperature is > 25°C or transport delayed for > 24 hours, store in cooler box or refrigerator (2-8°C). Keep cool but do not freeze.
- Inform the caregiver on estimated date of results and how these will be communicated. Provide a follow up appointment date for TB results.

7 POST-PROCEDURE INFECTION CONTROL

- Ask child and caregiver to wash hands with soap and water.
- Discard disposable items (tubing, gloves, aprons) in a biosafety bin.
- Wash your own hands thoroughly.
-
- If indoor sputum collection, also do the following to reduce airborne transmission:
- Remain in the room for 10 minutes before exiting.
- In rooms with extraction ventilation (6- 12 air changes/hour): wait ± 20 minutes between clients.
- In naturally-ventilated indoor rooms: wait 30–40 minutes between clients.
- Mark the door with a time when the room will be ready (e.g. cardboard clock).

Practical considerations

- These time gaps are ideal but may not always be possible.
- If not feasible: ensure consistent mask use, minimise time spent in enclosed spaces and maximise natural ventilation (i.e., open windows).

HOW TO INDUCE SPUTUM IN A CHILD

WATCH A LIVE DEMONSTRATION

- Scan the QR code or click on the link to watch a live demonstration of this procedure:
- Respiratory specimen collection for TB investigation in children: Desmond Tutu TB centre, Stellenbosch University.

CLICK HERE

PREPARE THE CAREGIVER AND THE CHILD

- Explain the procedure in simple terms to the caregiver and child and obtain consent/assent. Explain that coughing is normal and desired.
- Check that child has fasted for at least 2 hours, ideally 3-4 hours. Assess vital signs and clinical condition and document findings.

PREPARE YOURSELF AND THE ENVIRONMENT

- Wash hands with soap and water. Clean all surfaces with 70% alcohol or HibitaneTM solution.
- Put on the correct personal protective equipment (PPE): gloves, respirator mask, plastic apron.
- Use a dedicated cough room with good ventilation (6-12 air exchanges/hour) or a room ventilated to the outside.
- Place a sign on the door indicating the procedure is in progress.

GATHER EQUIPMENT

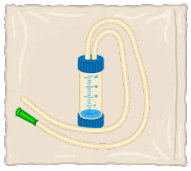
Nebulizer with tubing and face mask

Salbutamol nebules and normal saline

3–5% hypertonic saline solution

2 x syringes (5mL) and needles

Sputum specimen container (screw-top)



Sterile mucus extractor (6, 7, or 8 gauge)

Pulse oximeter (with child probe)

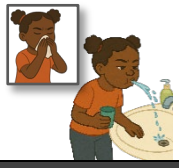
Suction and suction tubing

Paper towels and cotton wool

Laboratory request forms, pen, and specimen bags

Cold storage for transport

1 PREPARE THE CHILD'S MOUTH AND NOSE



- Ask child to rinse their mouth.
- Ask child to blow their nose into tissue to clear secretions.
- Wipe nose clean with saline and cotton wool.

2 LABEL THE SPECIMEN JAR/ TUBE

- Label sterile container with specimen label.

3 PREMEDICATE WITH SALBUTAMOL

- Assemble nebuliser and face mask.
- Give neb: use 1mL normal saline: 1mL salbutamol.
- Nebulise with mixed O2 flow at 5 - 8L/min, or jet nebuliser until chamber empty.

Note: Inhaler MDI and spacer with mask can be used instead

4 THEN NEBULISE WITH HYPERTONIC SALINE

- Add 2-4mLs hypertonic saline (3% or 5% NaCl) into the chamber.
- If < 2 years old: use 2mL hypertonic saline
- If ≥ 2 years old: use 4mL hypertonic saline
- Nebulise with mixed O2 flow at 5-8L/min.
- Continue until emptied OR until child starts to cough 2-3 times in quick succession.

5 MONITOR VITAL SIGNS

- Monitor oxygen saturation and pulse rate during the procedure.
- If sats drop < 92% or pulse rate ≥ 180 per minute, stop the procedure.

6 COLLLECT THE SPUTUM SAMPLE

- Keep a sputum collection container ready at all times.
- In older child (usually ≥ 6 years old), instruct child to cough and expectorate (cough up and spit out) sputum.
- If younger child (usually < 6 years old) and unable to expectorate, go straight to aspirating from nasopharynx in step 8 below.

7 IF THE CHILD STRUGGLES…

- Ask child to take several deep breaths, then cough deep from inside the chest.
- Ask them to lean forward and breathe slowly twice.
- On 3rd breath, ask them to cough deeply, and say:
- "Pull it from the bottom of your chest. When you feel the sputum at the back of your throat, try and push it to the front into your mouth". Demonstrate coughing up sputum.
- Ask them to spit into container. Repeat, until 2 mL collected.
- If the cough is dry, perform gentle chest percussion.

8 IF UNABLE TO EXPECTORATE, SUCTION NASOPHARYNX

- If unable to expectorate (usually children < 6 years old), suction though nasopharynx.
- Wrap child with head exposed.
- Estimate length of suction catheter to advance by measuring the distance between tip of the nose and the tragus of the ear.

9 CONNECT TO SUCTION

- Attach suction tubing to one end of mucus extractor trap.
- Start the suction machine or wall suction at 15-20kPA and increase only if needed.
- Occlude suction catheter between thumb and finger at the measured distance – this avoids contamination with mucus from the nasal cavity.

10 SUCTION NASOPHARYNX

- Carefully advance this length into nostril keeping away from the septum. Once entered at desired length, release & use gentle suction until at least 1.5mL of sputum obtained.
- Spend no more than 10 seconds with catheter in nasopharynx.

11 ASSESS THE SAMPLE AND CLOSE TIGHTLY

- A volume of more than 1.5mL is ideal.
- Avoid collecting watery saliva samples.
- Seal mucus extractor trap or sputum container well.
- Wipe down the outside of the container with alcohol swabs.

12 PACKAGE THE SPECIMEN

- Check that specimen is labelled correctly and place in a laboratory specimen bag. Label as Induced sputum or NPA.
- Complete the request form.
- Store the sample in a cold box (2–8°C) until transported to the laboratory.

13 POST-PROCEDURE INFECTION CONTROL

Collect second sample at least 4 hours later.

- Ask child to wash their hands with soap and water.
- Discard disposable items (tubing, gloves, aprons) into a biosafety bin.
- Wash hands thoroughly.
- Wait 10 minutes before exiting the room to allow clearance of airborne micro-organisms.
- Allow:
  - » 20 minutes between patients if using an extraction room (6-12 air exchanges/hour).
  - » 30-40 minutes if using a naturally-ventilated room.
- Mark the time on the door when the room will be ready for the next procedure (create a cardboard clock with hands that can be adjusted to change the time).

Practical considerations

- These time gaps are ideal but may not always be possible.
- If not feasible: ensure consistent mask use, minimise time spent in enclosed spaces and maximise natural ventilation (i.e., open windows).

HOW TO PERFORM A URINE LF-LAM TEST

WATCH A DEMONSTRATION VIDEO

Scan the QR code or click on the link to watch a live demonstration of this procedure.

CLICK HERE

CHECK ELIGIBILITY CRITERIA

LF-LAM test is only indicated in children and adolescents living with **HIV** (CLHIV) who **have TB symptoms** *and*:
If < 5 years old: CD4 count <25% within the last 6 months
If ≥ 5 years old: CD4 count < 200 within the last 6 months, *or*
Advanced HIV disease (WHO clinical stage 3 or 4 disease), *or*
Current serious illness requiring hospital admission

GATHER EQUIPMENT

Gloves

Sterile specimen collection container

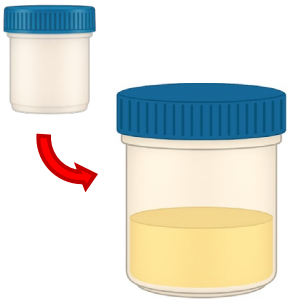
TB LAM Ag test

Bulb pipette (60µL) provided with the test kit

Timer to time 25 minutes

Biohazard medical waste bin

1 OBTAIN A URINE SAMPLE



- If possible, advise caregiver and child to obtain an early morning urine specimen.
- Give them the following advice on collecting a clean catch urine specimen:
  - » Clean and wipe dry the urogenital area before collecting urine.
  - » Allow the first stream of urine to flow past into the toilet, then catch the midstream urine into the container provided.
  - » Wipe the outside of the container dry.
  - » Wash hands after collecting.
- Note: If child too young to pass a clean catch urine specimen: use a urine bag to collect a specimen to use as 'screening test'.
  - » Only if this screening test is positive: obtain a sterile catheter sample to formally re-test (in-out method or suprapubic, if adequately trained). This formal sterile sample result will overrule the urine bag sample test.

2 PREPARE A TESTING AREA AND TAKE OUT A TEST STRIP

- Set up a testing area with all materials neatly arranged.
- Put on gloves.
- Check test kit and strips for damage - do not use damaged packaging or wet test strips. Record lot number, expiry date and storage conditions.
- Tear off a test strip and replace the rest in the foil pouch.
- Reseal the foil pouch with desiccant (small drying bag of crystals) immediately after removing a strip by pressing the seal closed.

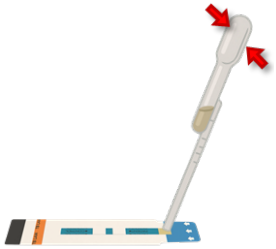
3 OPEN THE TEST STRIP

- Remove the protective foil cover to expose the test strip.
- Lay the test strip flat on the desk.

4 DRAW UP THE URINE SAMPLE

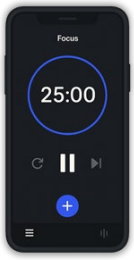
- Use the pipette provided.
- Hold the tip in the urine sample and firmly squeeze the upper bulb once, then release to aspirate a urine sample.
- It will automatically draw up the correct volume of urine (60 µL) for the test.

5 ADD SAMPLE TO TEST STRIP



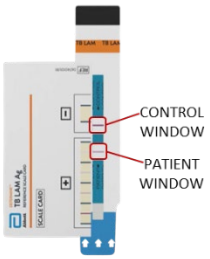
- Position the pipette over the sample window on the test strip.
- Then squeeze the upper bulb firmly and slowly to dispense the urine onto the test strip.
- Avoid lifting the pipette from the sample before all the urine is transferred.

6 START THE TIMER



- Start the timer for 25 minutes.
- Ensure the test is labelled with the patient's details and set aside safely where it cannot be tampered with or confused with other tests.

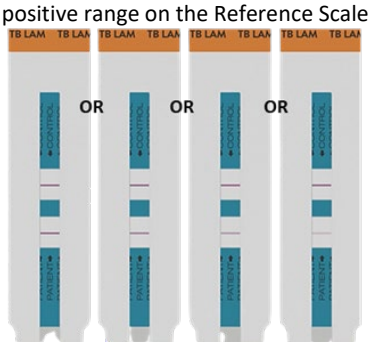
7 INTERPRET THE RESULT



- After 25 minutes, use the 'Reference Scale Card' to read results.
- First check if there is a band visible in the control window of the test strip. There must be a bar in the control window for the test to be valid.
- Next check the patient window and compare below.

POSITIVE

- Two bars appear: one in control window and one in patient window.
- The line should be equal to, or stronger, than any of the bars in the positive range on the Reference Scale Card.



The lines can be different intensities.

All these examples are considered "**Positive**".

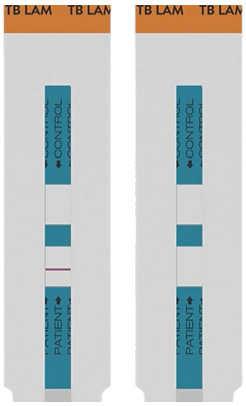
- If LF-LAM positive in an eligible child, diagnose TB.
- Notify as 'clinically diagnosed TB' and start treatment that day. Also send sputum or stool sample for TB NAAT for DST purposes.

NEGATIVE

Only one bar in the control window. No bar in the patient window.

INVALID

- No bar in the control window.
- Bar or no bar in the patient window.
- Repeat the test.



8 Document results

Document the results of the TB LF-LAM test in the patient's notes and RTHB.

9 Discard sample and used materials

- Discard the urine safely.
- Dispose of the test strip, pipette, and gloves in the biosafety bin.

HOW TO PERFORM A NASOGASTRIC ASPIRATE

WATCH A LIVE DEMONSTRATION

- Scan the QR code or click on the link to watch a live demonstration of this procedure:
- Respiratory specimen collection for TB investigation in children: Desmond Tutu TB centre, Stellenbosch University.

CLICK HERE

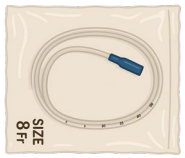
PREPARE THE CAREGIVER AND THE CHILD

- Explain the procedure in simple terms to the caregiver and obtain consent.
- Confirm the child has fasted for at least 4 hours.

PREPARE YOURSELF AND THE ENVIRONMENT

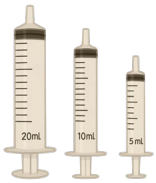
- Wash hands with soap and water. Clean all surfaces with 70% alcohol or HibitaneTM solution.
- Put on the correct personal protective equipment (PPE): gloves, respirator mask, plastic apron
- If possible, have 2-3 people ready to assist – ensure they are wearing the correct PPE too.
- Use a dedicated cough room with good ventilation (6-12 air exchanges/hour) or a room ventilated to the outside.
- Place a sign on the door indicating the procedure is in progress.

GATHER EQUIPMENT



Nasogastric tube (6-10 Fr)

Screw-top specimen jar (ideally a falcon tube)



3 x syringes (20mL, 10mL, and 5mL)

Litmus PH paper

5mL of 4% Sodium Bicarbonate

Oxymetazoline nasal drops

Local anaesthetic gel/lubricant

At least 1 sheet or drape to wrap child

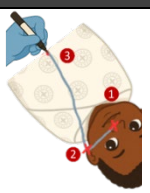
Alcohol swabs

Laboratory request forms, pen, black marker and specimen bags

1 PREPARE THE CHILD'S MOUTH AND NOSE

- Wrap child in a sheet/drape leaving the head exposed.
- Position the child in a supine (lying on back) position.
- Put 2 drops oxymetazoline in each nostril to reduce bleeding risk.

2 MEASURE AND PREPARE THE NG TUBE

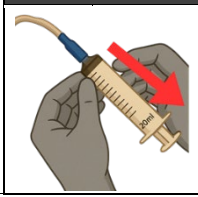


- Measure how far the tube will need to be inserted. Nose to ear to just below the xiphisternum. Mark the length on the tube with a marker.
- Lubricate the tube with local anaesthetic gel/lubricant.

3 INSERT THE NASOGASTRIC TUBE

- Place the child's head in a 'sniffing' position.
- Gently insert the tube through the nose into the stomach.
- Insert up to the black mark (the correct length, measured in the previous step).

4 ASPIRATE GASTRIC CONTENTS



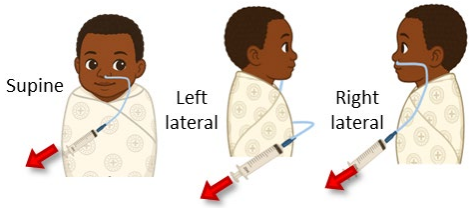
- Attach the 10mL or 20mL syringe and withdraw gastric contents gently.

5 CONFIRM PLACEMENT OF THE TUBE

- Confirm that the tube is in the correct place by checking the pH of the aspirate. The litmus paper colour should match pH of around 5.

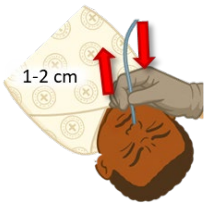
6 ASPIRATE IN 3 DIFFERENT POSITIONS

- Aspirate in 3 positions:



- Wait a few seconds between changing positions.

7 ADJUST POSITION OF TUBE, IF NEEDED



- If no fluid is obtained, adjust the tube by 1-2 cm (in or out) and retry.

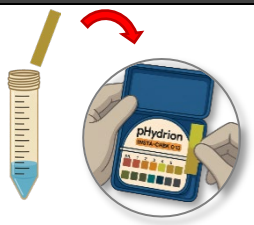
8 TRANSFER THE SAMPLE

- Transfer aspirate into a sterile specimen container.
- Several attempts may be needed.
- Aim for 5mL of gastric fluid. The minimum acceptable volume is 1mL.

9 GENTLY REMOVE THE NG TUBE

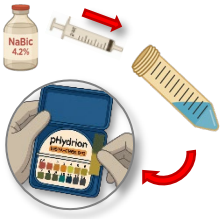
- Once you have collected enough specimen fluid, gently remove the tube, and sit the child up.

10 CHECK THE PH OF THE ASPIRATED FLUID



- Check the pH of the aspirate.

11 IF NEEDED, NEUTRALISE THE SAMPLE



- If the pH < 6.5, add 0.3mL of 4% sodium bicarbonate using a pipette or syringe.
- Mix well and recheck pH.
- If pH still < 6.5, repeat until pH reaches 6-7.
- If pH is already > 6.5, no bicarbonate is needed.

This is done to neutralise stomach acid and preserve M.tb for accurate testing (increases survival of viable bacilli).

12 LABEL AND SECURE THE SAMPLE

- Clean the outside of the specimen jar with alcohol swabs.
- Label the sample with:
  - » Patient details
  - » Sample type and number
  - » Date and time
  - » Time of neutralisation
  - » Volume of bicarbonate added
  - » Total sample volume
- Place the container in a lab specimen bag, then into a cold box (2-8°C) for transport.

13 POST-PROCEDURE INFECTION CONTROL

- Discard disposable items (tubing, gloves, aprons) into a biosafety bin.
- Wash hands thoroughly.
- Wait 10 minutes before exiting the room to allow clearance of airborne micro-organisms.
- Allow:
  - » 20 minutes between patients if using an extraction room (6-12 air exchanges/hour).
  - » 30-40 minutes if using a well-ventilated room.
- Mark the time on the door when the room will be ready for the next procedure (create a cardboard clock with hands that can be adjusted to change the time).

HOW TO PERFORM A TUBERCULIN SKIN TEST (TST)

INTRODUCTION

- A Tuberculin Skin Test (TST) tests for TB infection, not TB disease. It is unable to differentiate between TB infection and disease.
  - » A positive TST confirms that a child has been infected with TB, either now or in the past.
  - » A negative TST does not exclude TB infection or TB disease.
- A TST provides no additional information on a child who is already known to have TB exposure.
- It has a role to play in an ill child with vague features that might be due to TB and in whom TB exposure is unknown.
- TST requires a functional immune system and sufficient time after TB exposure (typically > two weeks) to mount an appropriate response.
- A TST is NOT a requirement to start TB Preventive Treatment (TPT).

If no clear history of contact with a TB source case, consider doing a TST if any uncertainty remains about TB diagnosis and the child is < 5 years old.

PREPARE THE CAREGIVER AND THE CHILD

- Explain the procedure in simple terms to the caregiver and the child and obtain verbal consent/assent.

GATHER EQUIPMENT

A vial of Tuberculin purified protein derivative (PPD) (kept at 2-8°C)

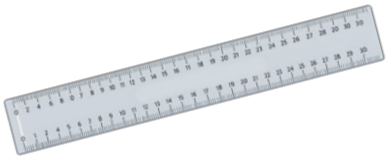
Gloves

Alcohol swab or cotton wool swab and normal saline

1mL syringe and 2x needles (27G) (If unavailable, an insulin syringes may be used)

Gauze swabs

Ball point pen



Ruler or tape measure for measuring

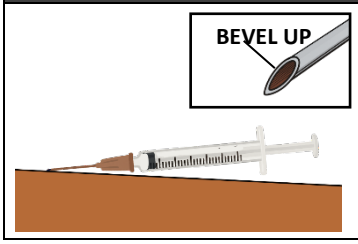
1 CLEAN THE AREA

- Using either a cotton wool swab and normal saline or an alcohol swab, cleanse the inner surface of the child's left forearm well.
- Allow area to dry.
-

2 DRAW UP THE TUBERCULIN PPD

- Check expiry date; clean vial top.
- Use tuberculin syringe with 27G needle: draw 0.1 mL PPD.
- Keep vial on ice or return to fridge (2–8°C).
- Attach new 27G needle.

3 POSITION THE NEEDLE AND SYRINGE

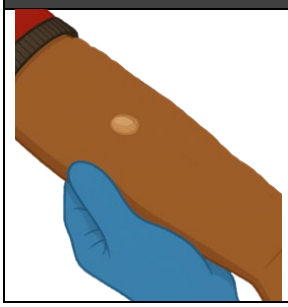


- Face the needle bevel (hole) upwards.
- Hold syringe almost flat against child's arm and insert needle just under the skin, about 5-10 cm below the elbow - depending how big the child is.

4 ASPIRATE GASTRIC CONTENTS

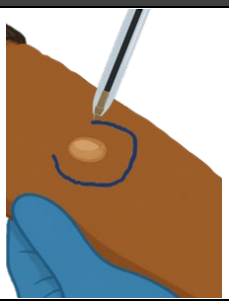
- Slowly inject the PPD intradermally (into the superficial layers of the skin).
- A bleb or wheal should appear as you inject.
- Remove needle - if minor bleeding at injection site, dab lightly with gauze without applying pressure.

5 CHECK THE WHEAL FORMED



- There should now be a 6-10mm wheal (pale, raised area with distinct edges and an orange-peel appearance, which does not disappear immediately.
- If no wheal develops or it is < 6mm, repeat the test 5cm away from original site or on the other arm.

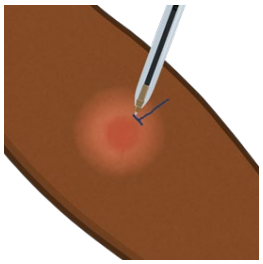
6 MARK THE SITE OF THE TST



- Mark the site of the TST with a ball point pen.
- Record date, time and site of the TST in the notes and RTHB.
- Advise not to cover with plaster and avoid scratching.
- Advise to return after 48-72 hours to read the result.

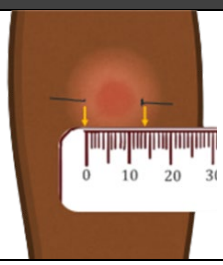
AFTER 48-72 HOURS, READ THE TST RESULT

1 LOCATE AND MARK THE AREA OF INDURATION



- 'Induration' refers to a thickened, hardened area of skin from swelling and inflammation. It is not just redness.
- Use a ball point pen to draw a pen line, starting 1-2cm away from skin reaction.
- Start at the edge of the arm and move slowly towards its centre.
- Press down on the pen with a moderate pressure until a resistance is felt due to the raised margin of the indurated skin.
- Mark where this induration starts.
- Do the same from the other side.

2 MEASURE THE INDURATION



- Measure the area of induration across the forearm.
- Remember not to measure the area of erythema (redness).
- Use a ruler or measuring tape that shows millimetres (mm).

- Record the result in mm – not just positive or negative.
- Explain the results to the caregiver.

Positive if ≥ 10mm, or ≥ 5mm in a CLHIV or malnourished child.

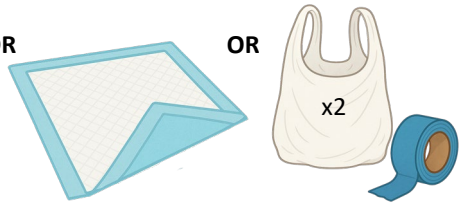
Negative if < 10mm, or < 5mm in a CLHIV or malnourished child.

HOW TO COLLECT STOOL SAMPLES - TIPS FOR CAREGIVERS

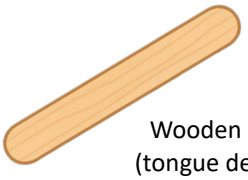
ADVISE THE CAREGIVER TO HAVE THE FOLLOWING ITEMS READY

Screw-top specimen jar – ideally a stool specimen jar.

If infant: clean nappy



If older child: linen saver ***or*** plastic shopping bag and some tape



Wooden spatula (tongue depressor)

Gloves

GENERAL INSTRUCTIONS FOR CAREGIVERS

- Advise caregivers to wear protective gloves during the collection of stool specimens.
- Ensure stool samples do not touch any bleach, cleaning products on surfaces/linen savers as it may kill the TB.

For babies and infants:

- Put on a clean nappy. Once stool has been passed, use a wooden tongue depressor to scrape solid stool from the nappy or underpants into a specimen container – collect a small amount of stool equal to the size of an adult fingernail. Aim to collect the more solid stool if possible.
- Whenever possible, collect stool that has not been in contact with urine - choose a sample from the part of the stool that has the least contact with the nappy.

For older children and adolescents:

- Whenever possible, collect stool that has not been in contact with urine - ask child to urinate before starting this process.
- Have child pass stool onto a linen saver or place a plastic shopping bag (without holes) over or under the toilet seat to collect stool. This may be taped in place.
- After the stool motion, use a wooden tongue depressor to scrape solid stool from the linen saver/plastic bag into the specimen container - collect a small amount of stool equal to the size of an adult fingernail. Aim to collect the more solid stool if possible.
- Empty remaining contents of the linen saver/plastic bag into the toilet, place the used bag/linen saver, spatula and gloves inside a second bag, and discard in the refuse.

- **Wash hands thoroughly after completing collection.**

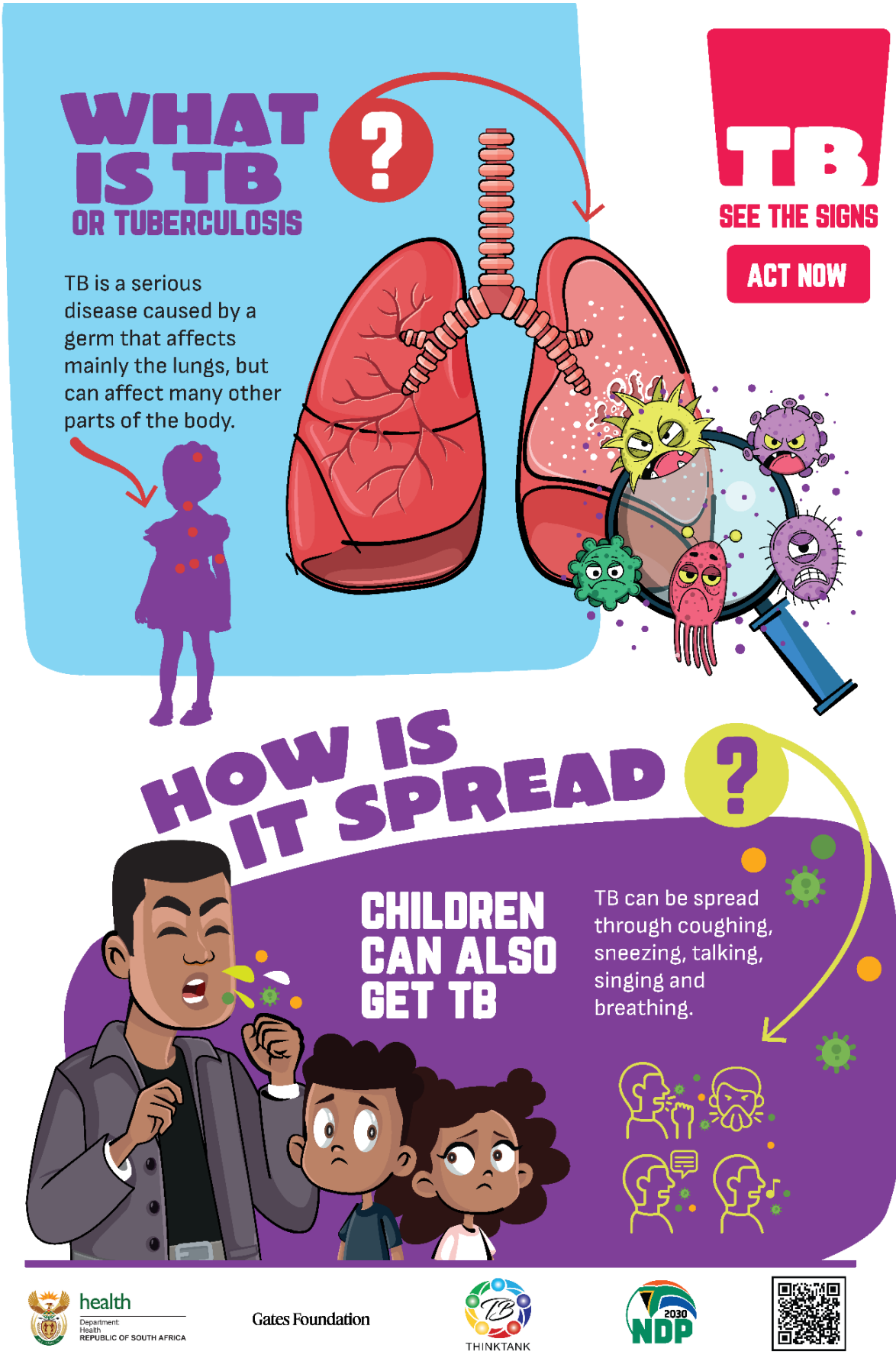
- Advise caregiver to deliver the sample to the clinic within 2 hours, if possible.
- Once at the clinic, label the container with the child's full name, date of birth, date and time of collection.
- Place specimen in a cooler box and transport to the laboratory as soon as possible.

Specimens are considered stable for 2 hours at room temperature, and 7 days at 4°C.

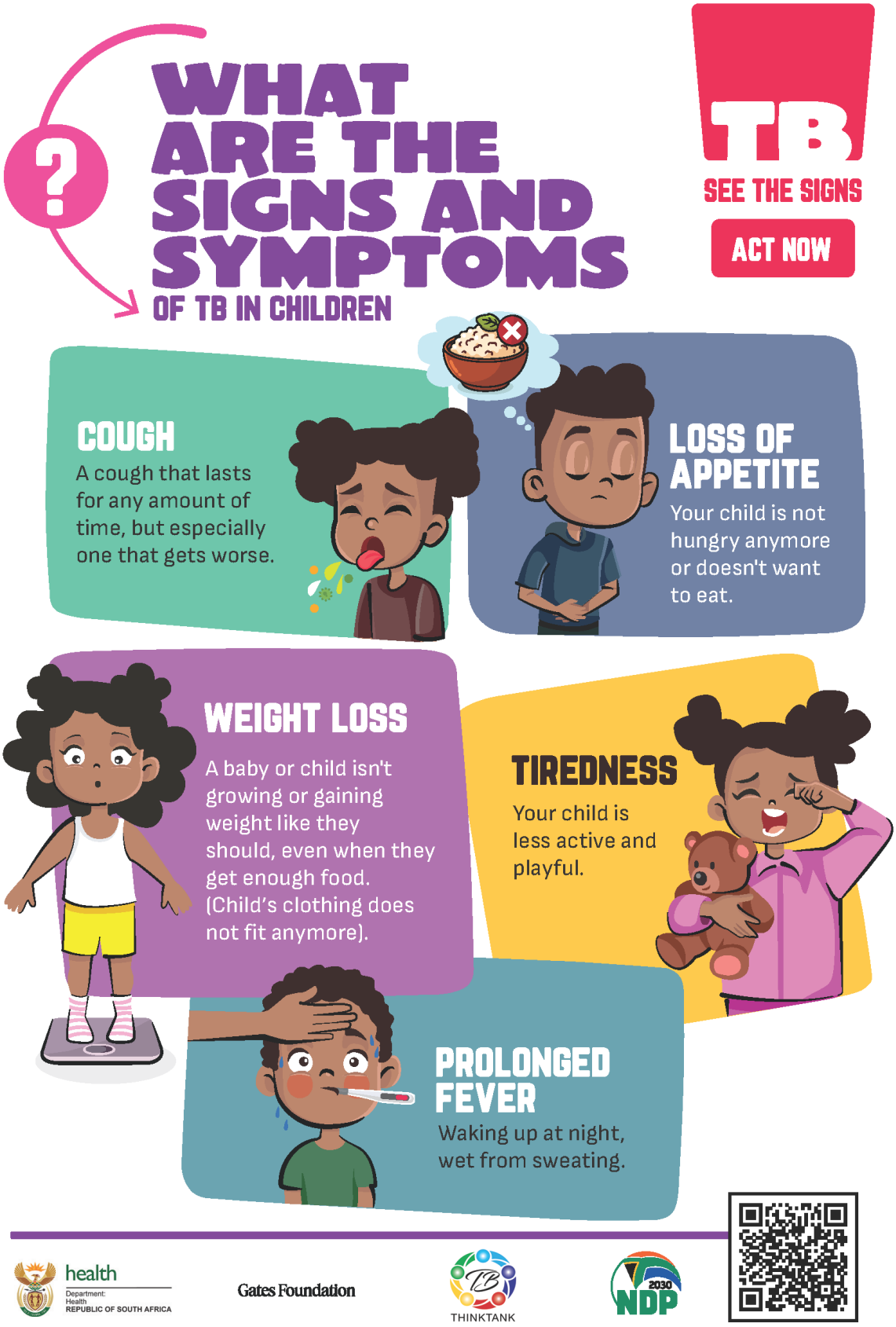
Section 8

Patient education materials/support

POSTER: WHAT IS TB



POSTER: WHAT ARE THE SIGNS AND SYMPTOMS OF TB IN CHILDREN



POSTER: HOW IS TB DIAGNOSED IN CHILDREN

CAREGIVER GUIDE: EASY DOSING GUIDE FOR TB MEDICATION IN CHILDREN-1

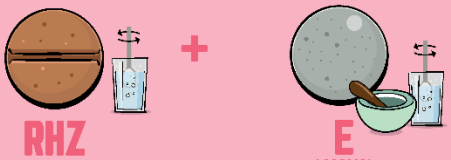
TB MEDICATION FOR CHILDREN:

EASY DOSING GUIDE

IN 3 EASY STEPS

YOU WILL GET

RHZ (75/50/150) **and** Ethambutol (400mg)



RHZ
(75/50/150)

Rifampicin + Isoniazid + Pyrazinamide (RHZ) is a tablet that mixes easily in water.

E
(400MG)

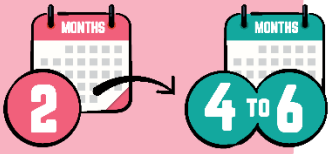
Ethambutol is a tablet that you can crush and mix with water.

NOTE

CAN YOUR CHILD SWALLOW TABLETS?

Teach your child to swallow whole tablets or halves. If your child cannot swallow tablets, you will need to crush and mix the tablets in water to make it easier to give to your child.

You will need to prepare BOTH medicines and give your child both medicines every day (and weekends!). After 2 months, your child's medicine will change. Your child will be taking medicine for a total of 4 to 6 months.



If possible give medication on empty stomach, but can be taken with food.

STEP 1

YOUR NURSE WILL CHECK YOUR CHILD'S WEIGHT

STEP 2

YOUR CHILD'S WEIGHT WILL BE CHECKED AGAINST THE DOSING CHART

health
Department:
Health
REPUBLIC OF SOUTH AFRICA

Gates Foundation

THINKTANK

2030 NDP

CAREGIVER GUIDE: EASY DOSING GUIDE FOR TB MEDICATION IN CHILDREN -2

STEP 3 **FOLLOW THE DOSING CHART**

TB MEDICATION FOR CHILDREN:

CAREGIVERS: USE THIS CHART TO PREPARE YOUR CHILD'S DOSE

	RHZ (75/50/150)	ETHAMBUTOL (400MG)
Medicine	**Swallow whole OR dissolve** the tablet in water.	**Swallow whole OR crush and mix** the tablet in **8ml** of water
Child's Weight	For children less than 2 kg in body weight, please talk to an expert	
2 – 2.9 kg	**Mix ½ a tablet in 5ml of water.**	**Use only 1ml** from your prepared 8ml of crush and mix. Throw away the unused mixture.
3 – 3.9 kg	**Mix the tablet in 4ml of water.** Give only 3ml of your mixture. Throw away the rest.	**Use only 1.5ml** from your prepared 8ml of crush and mix. Throw away the unused mixture.
4 – 7.9 kg	**Mix 1 tablet in 5ml of water.**	**Use only 2.5ml** from your prepared 8ml of crush and mix. Throw away the unused mixture.
8 – 11.9 kg	Give your child **2 tablets to swallow OR mix the tablets** in 10ml of water.	OR Give your child **½ a tablet to swallow OR use only 4ml** from your prepared 8ml of crush and mix. Throw away the unused mixture.
12 – 15.9 kg	OR Give your child **3 tablets to swallow OR mix the tablets** in 10ml of water.	**Use only 6ml** from your prepared 8ml of crush and mix. Throw away the unused mixture.
16 – 24.9 kg	OR Give your child **4 tablets to swallow OR mix the tablets** in 10ml of water.	OR Give your child **1 tablet to swallow OR use all 8ml** from your prepared 8ml of crush and mix.
For children heavier than 25kgs	**RHZE** This is one tablet with all four medicines in it. Swallow whole tablets as they are with water. Follow the dosing guide below.	
25 – 29.9 kg	**2 tablets**	
30 – 34.9 kg	**3 tablets**	
35 – 64.9 kg	**4 tablets**	
65 kg & heavier	**5 tablets**	

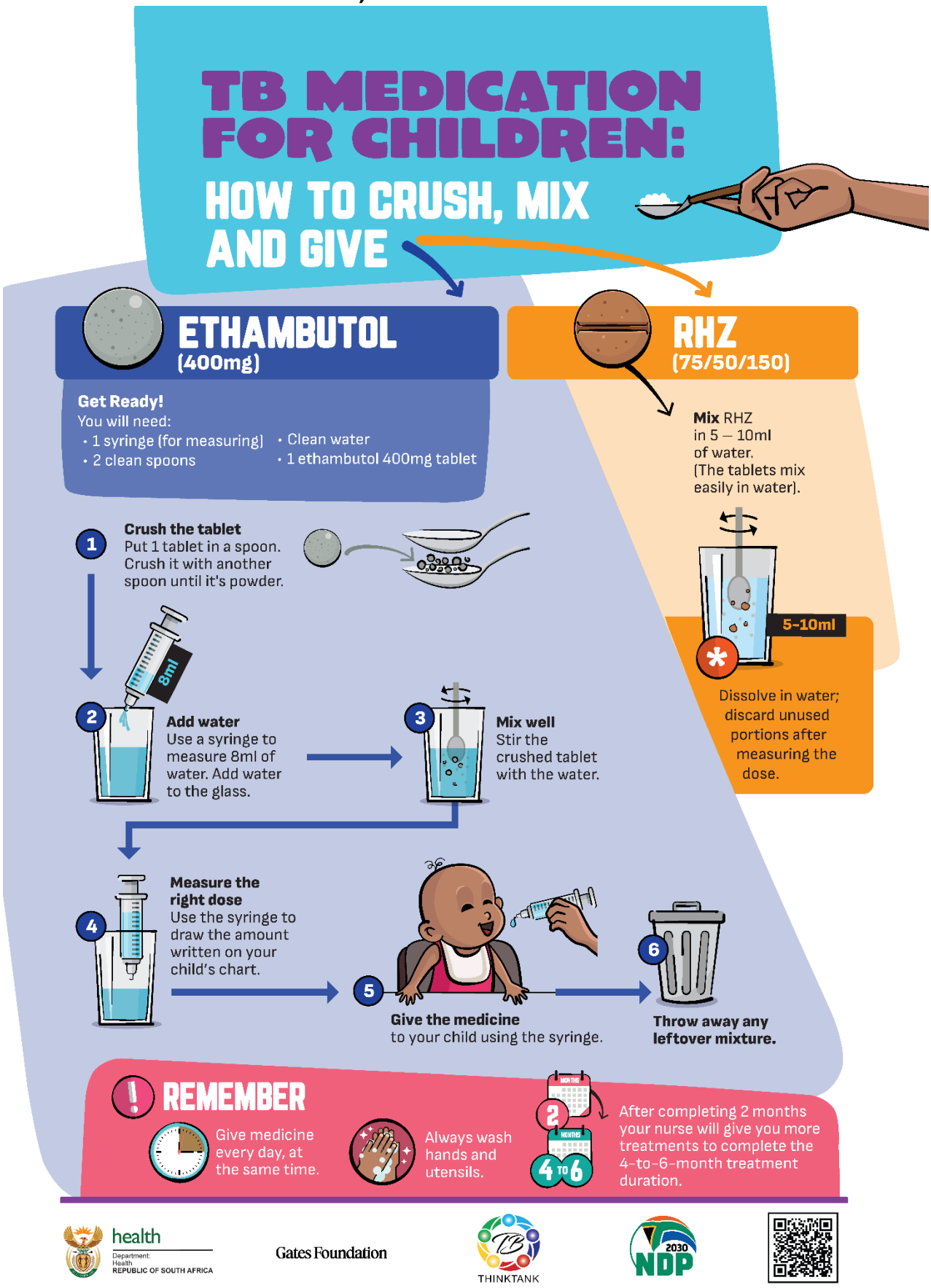
health Department: Health REPUBLIC OF SOUTH AFRICA

Gates Foundation

THINKTANK

NDP 2030

CAREGIVER GUIDE: HOW TO CRUSH, MIX AND GIVE TB MEDICATION IN CHILDREN



CARING FOR A CHILD WITH TB

A GUIDE FOR CAREGIVERS

This guide is here to help you understand TB and how to care for your child during treatment.
You are not alone!

Name: _____

Age: _____

Type of TB: _____

MILESTONE TRACKER

FILL THIS IN WITH YOUR HEALTH WORKER

DATE	WEIGHT (KG)	MEDICATION DOSE	
		RHZ (75/50/150) **Swallow whole OR** dissolve the tablet in water.	ETHAMBUTOL (400MG) **Swallow 1 tablet whole OR crush and mix** the tablet in 8ml of water.
Day 0		Give ____ mls/____ tablets	From your prepared 8ml of crush and mix. Give ____ mls/____ tablets
Day 14			
Month 1		Give ____ mls/____ tablets	Give ____ mls/____ tablets
Month 2		Give ____ mls/____ tablets	Give ____ mls/____ tablets
		RHZ (75/50/150)	
Month 4		Give ____ mls/____ tablets	
Month 6		Give ____ mls/____ tablets	
Month 9*		Give ____ mls/____ tablets	
Month 12		Give ____ mls/____ tablets	

You can do this — one day at a time.

YOU ARE NOT ALONE!

Ask for help if you feel tired or worried. – Celebrate every small step. Each day brings your child closer to being healthy again!

NEED HELP? FOR SUPPORT

Call your local clinic or the TB Hotline

Talking to someone you trust can lighten the load.

Don't feel ashamed — dealing with TB shows courage, not weakness.

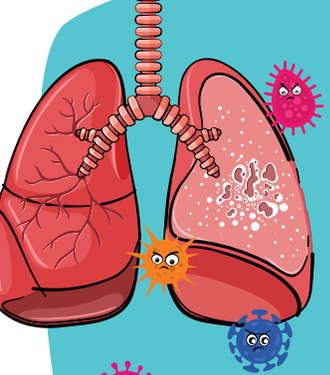
END TB

health
Department:
Health
REPUBLIC OF SOUTH AFRICA

THINKTANK

2030 NDP

Gates Foundation



WHAT IS TB?

TB is a sickness caused by germs that usually affect the lungs.

TB spreads when someone with TB coughs, sneezes, or talks.

Be kind to yourself and to others – getting TB is nobody's fault.

GIVING TB MEDICINE AT HOME

Your child must take medicine every day, even if they feel better.

Use clean hands, wash utensils, and clean water.

Some tablets can be crushed and mixed with water.

Children can get better with the right medicine!

Use a syringe to give the right dose.

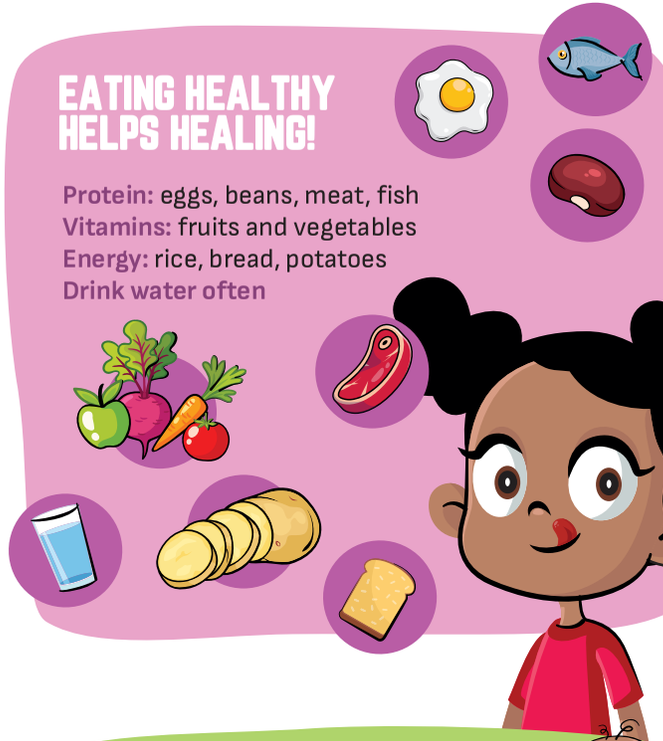
Don't reuse leftover medicine.

TIPS

Make it fun: sing a song, give a small reward. - If your child doesn't want to take the medicine, try again later.

EATING HEALTHY HELPS HEALING!

Protein: eggs, beans, meat, fish
Vitamins: fruits and vegetables
Energy: rice, bread, potatoes
Drink water often



TB SYMPTOMS TO WATCH FOR

CARING AT HOME

Everyone living with your child should be checked for TB.

Contacts may need TPT if found not to have TB.

TB spreads in small spaces with poor air.

Open windows to let in fresh air.

Wear masks if needed.

Cover coughs.

Wash hands often.

SIDE EFFECTS

TO TELL THE NURSE OR DOCTOR ABOUT

Stomach pain or vomiting

- Joint pain
- Skin rash
- Tingling in hands or feet
- Stomach pain
- Vomiting

Skin rash or dark skin

Yellow eyes – Vision problems

Feeling very dizzy

IF THE CHILD DOES NOT IMPROVE, GET HELP FAST:

DANGER SIGNS:
Seizures/Drowsiness, yellow eyes, bad headache/stiff neck, not peeing much.

HELPLINES AND USEFUL RESOURCES

- National Clinical Advisory Committee(NCAC): NCAC@witshealth.co.za
- Medicines Information Centre (University of Cape Town): pha-mic@uct.ac.za; Tel: (021) 406-6829 or WhatsApp: 071 840 1572

HELPLINES

If in doubt about any aspect of HIV or TB management, contact one of the following resources:

National HIV & TB Health Care Worker Hotline: 0800 212 506 or send a WhatsApp 071 840 1572

Right to Care Paediatric Adolescent and Adult HIV Helpline: 082 352 6642

KZN Paediatric Hotline: 082 352 6642

USEFUL RESOURCES

CALCULATOR: QTC INTERVAL

https://www.mdcalc.com/calc/48/corrected-qt-interval-qtc

HIV MEDICATION INTERACTION CHECKER

https://www.hiv-druginteractions.org/checker

The Union CXR ATLAS – CHILDHOOD TB IMAGE LIBRARY

https://atlaschild.theunion.org

The Union DIAGNOSTIC CXR ATLAS FOR TB IN CHILDREN

https://bit.ly/4jszAn2

RESPIRATORY TB SPECIMEN COLLECTION

https://bit.ly/4cV4xhp

MEDICINES INFORMATION CENTRE - RESOURCES

https://mic.uct.ac.za/educational-materialposters

ABBREVIATIONS

ALHIV	adolescent living with HIV
ART	antiretroviral therapy
BCG vaccine	bacillus calmette-guérin vaccine
B or Bdq	bedaquiline
BMI	body mass index
BPaL	bedaquiline, pretomanid, linezolid
BPaL-L	bedaquiline, pretomanid, linezolid and levofloxacin
BDLLfxC	Bedaquiline, delamanid, levofloxacin, clofazimine
C or Cfz	clofazimine
CLHIV	child living with HIV
CNS	central nervous system
CXR	chest x-ray
D or Dlm	delamanid
DST	drug susceptibility testing
DS-TB	drug-susceptible tuberculosis
DTG	dolutegravir
E	ethambutol
EPTB	extrapulmonary tuberculosis
Eto	ethionamide
FQ	fluoroquinolones
H	isoniazid
Hgt	haemoglucotest
hdH or hdINH	high dose isoniazid
RH	isoniazid and rifampicin
IMCI	integrated management of childhood illness
IGRA	interferon-gamma release assay
L or Lzd	linezolid
LF-LAM	lipoarabinomannan lateral flow assay
Lfx	levofloxacin
NAAT	nucleic acid amplification test
NCAC	national clinical advisory committee
NMC	notifiable medical condition
P or Rpt	rifapentine
Pa	pretomanid
PTB	pulmonary tuberculosis
PZA	pyrazinamide
R	rifampicin
RR-TB	rifampicin-resistant tuberculosis
RTHB	road to health book
SEs	side effects
TBM	tuberculous meningitis
TBIC	tuberculosis infection control

TPT	tuberculosis preventive treatment
VL	viral load
WFA	weight-for-age
Z	pyrazinamide
3HP	3 months of weekly isoniazid plus rifapentine
3RH	3 months of rifampicin and isoniazid
6H	6 months of isoniazid
12H	12 months of isoniazid

DEFINITIONS

Adherence	The extent to which a person's behaviour corresponds with agreed recommendations from a healthcare worker for taking medication, following a diet and/or making lifestyle changes.
Adolescent	A person aged 15 to 19 years.
Child	For practical purposes, children weighing > 25 kg (typically 8 to 10 years of age) can be treated with adult doses of TB medications including for TB preventive treatment (TPT). Children weighing > 25 kg can also usually produce sputum for TB testing. For reporting purposes, children are defined as 0 to 14 years of age by WHO.
Evaluation	The periodic assessment of the change in targeted results that can be attributed to the programme intervention, or the analysis of inputs and activities to determine their contribution to results.
Genotypic	Genotypic testing is a way to check if TB bacteria are resistant to medicine by looking at their genes (DNA). This test finds changes (mutations) in the genes that are known to cause drug resistance. It is fast and can give results in a few hours or days. However, it might miss resistance if the gene change is new or not well known.
Infant	A child under one year of age.
Index patient/ case	A person (adult or adolescent) with infectious pulmonary TB.
Latent TB infection	A state of immune response to stimulation by Mycobacterium tuberculosis antigens, indicated by a positive tuberculin skin test (TST) or interferon-gamma release assay (IGRA) test, with no evidence of active TB disease.
Monitoring	The tracking of key elements of programme performance (inputs, activities and results) on a regular basis to provide continuous information on progress towards achieving goals, and alert staff and managers to problems, providing an opportunity for these to be resolved early.
Recent TB exposure	Contact with a person diagnosed with pulmonary TB in the last 12 months. The person may be from the same household or be a close contact outside of the household setting, e.g., a care provider, colleague, teacher, family member or friend.
Significant TB exposure	Known exposure to a person (adult or adolescent) with pulmonary TB who shared the same enclosed space for one or more nights or for frequent or extended daytime periods during the three months before the index patient starting their TB treatment. Significant TB exposure can occur in any setting, e.g., the household, workplace, place of learning or care. Therefore, the term "household contact" is confusing since it is limited in scope and should no longer be used. "TB contact" will therefore be used throughout this document.
TB contact	All people (family members and other individuals; regardless of age and HIV status) who have had a 'significant TB exposure' – that is: shared the same enclosed space or shared living arrangement with a TB index patient for one or more nights or for frequent or extended daytime periods during three months before the start of current TB treatment in the index patient with pulmonary TB.
TB disease	Disease caused by Mycobacterium tuberculosis. TB can either be bacteriologically confirmed or clinically diagnosed.
TB exposed infants	Infants born to mothers who were diagnosed with TB before or after the baby was born, or other documented close TB exposure in the infant (e.g. another caregiver, family member, day care provider).

Acknowledgements

Funding

This work was made possible through the generous support of the Gates Foundation, whose funding enabled the development and refinement of this reference document.

Clinical Advisory team

Dr Karen Du Preez, Desmond Tutu TB Centre, Stellenbosch University
Dr Juli Switala, The Aurum Institute
Dr Juaneta Luiz, University of Cape Town
Dr Lenny Naidoo, City of Cape Town: Health
Dr Susan Purchase, Desmond Tutu TB Centre, Stellenbosch University
Dr Cordelia Ely, Western Cape Department of Health and Wellness
Mrs Anri Uys, University of Cape Town
Mrs Melanie Holtman, Western Cape Department of Health and Wellness
Dr Nirupa Misra, KwaZulu-Natal Department of Health
Prof Simon Schaaf, Stellenbosch University
Dr Samantha Zealand-Smith, Eastern Cape Department of Health
Dr Anja Reuter, City of Cape Town: Health
Dr Limpho Ramangoaela, The Aurum Institute
Dr Jenny Hughes, Desmond Tutu TB Centre, Stellenbosch University
Prof Marieke van der Zalm, Desmond Tutu TB Centre, Stellenbosch University
Mrs Margaret Van Niekerk, Desmond Tutu TB Centre, Stellenbosch University

National Department of Health

Dr Lindiwe Mvusi
Prof Norbert Ndjeka
Mrs Yulene Kock

TB Think Tank Secretariat

Dr Priashni Subrayen
Dr Jody Boffa
Mr Mthokozisi Dube
Ms Farzana Sathar
Ms Nolwazi Nkosi

We gratefully acknowledge the wider **TB Think Tank Child, Adolescent and Maternal TB Working Group** for their expert input and thoughtful review, which played a key role in shaping this guideline.

We also extend our sincere thanks to the **health care workers on the ground** who contributed their time and practical insights during the **field testing process**, helping to ensure the guideline is clear, relevant, and applicable in real-world settings.

Lead Knowledge Translator and project coordinator

Dr Sandy Picken
Dr Karen Du Preez

Graphic Design

Ms N van der Schyff

Guidelines synthesised in this Quick Reference Guide