



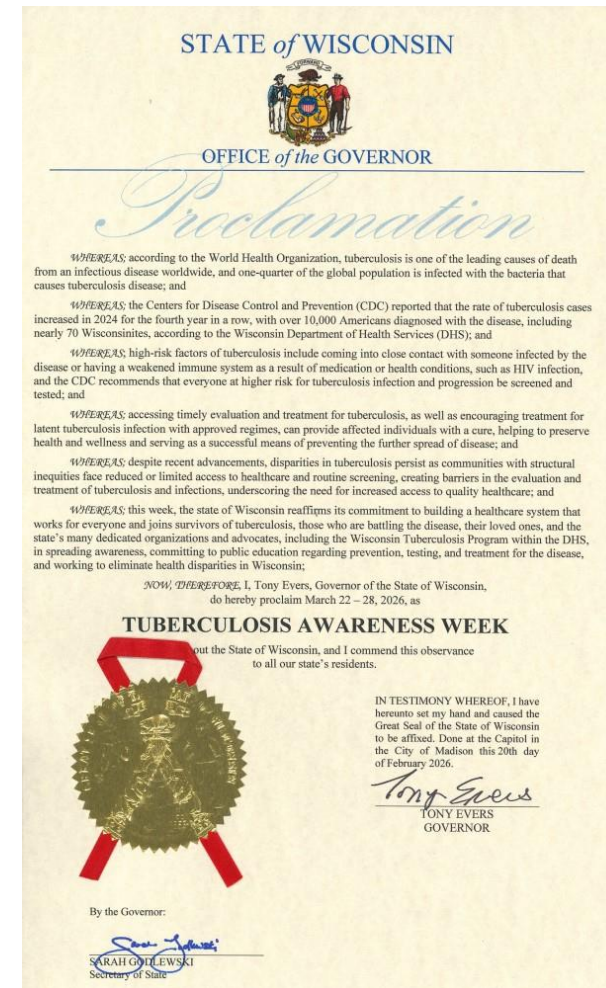
WISCONSIN DEPARTMENT  
*of* HEALTH SERVICES

# Tuberculosis Case Management Troubleshooting

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March 24, 2026

# Happy TB Awareness Week!

Wisconsin Governor's Office  
declares **March 22-28, 2026**, as  
[Tuberculosis Awareness Week!](#)







# Agenda

- LTBI Regimen Options
- Adverse Reactions
- Verifying Treatment Completion with Dose Counting
- Leveraging Resources for Adherence

# LTBI Regimen Options

Increasing Tolerance, Drug Interactions, Regimen  
Specific Reminders

# Regimens for LTBI Treatment

	DRUG	DURATION	FREQUENCY	TOTAL DOSES	DOSE AND AGE GROUP
Preferred	ISONIAZID <sup>†</sup> AND RIFAPENTINE <sup>††</sup> (3HP) 	3 months	Once weekly	12	<b>Adults and children aged ≥12 yrs</b> INH: 15 mg/kg rounded up to the nearest 50 or 100 mg; 900 mg maximum RPT: 10–14.0 kg; 300 mg 14.1–25.0 kg; 450 mg 25.1–32.0 kg; 600 mg 32.1–49.9 kg; 750 mg ≥50.0 kg; 900 mg maximum  <b>Children aged 2–11 yrs</b> INH <sup>†</sup> : 25 mg/kg; 900 mg maximum RPT <sup>††</sup> : See above
	RIFAMPIN <sup>§</sup> (4R) 	4 months	Daily	120	<b>Adults:</b> 10 mg/kg; 600 mg maximum <b>Children:</b> 15–20 mg/kg <sup>‡</sup> ; 600 mg maximum
	ISONIAZID <sup>†</sup> AND RIFAMPIN <sup>§</sup> (3HR) 	3 months	Daily	90	<b>Adults</b> INH <sup>†</sup> : 5 mg/kg; 300 mg maximum RIF <sup>§</sup> : 10 mg/kg; 600 mg maximum <b>Children</b> INH <sup>†</sup> : 10–20 mg/kg <sup>‡</sup> ; 300 mg maximum RIF <sup>§</sup> : 15–20 mg/kg; 600 mg maximum
Alternative	ISONIAZID <sup>†</sup> (6H/9H) 	6 months	Daily	180	<b>Adults</b> Daily: 5 mg/kg; 300 mg maximum Twice weekly: 15 mg/kg; 900 mg maximum
			Twice weekly <sup>¶</sup>	52	
		9 months	Daily	270	<b>Children</b> Daily: 10–20 mg/kg <sup>‡</sup> ; 300 mg maximum Twice weekly: 20–40 mg/kg <sup>‡</sup> ; 900 mg maximum
			Twice weekly <sup>¶</sup>	76	

# Isoniazid (INH, H)

- Included in the 3HP, 3HR, and 6H/9H regimens.
- Available as tablets, in 100mg or 300mg strength, or compounded (contains sorbitol).
- Gives side effects to more than 10% of people.

# Common Side Effects of INH

- Mild increase in liver enzymes
- Peripheral neuropathy
- Loss of appetite, nausea and/or vomiting
- Stomach pain
- Weakness, numbness
- Fever
- Skin eruptions or rash
- Headaches

# Rifampin (Rif, R)

- Included in the 3HR and 4R regimens.
- Available as capsules, in 150mg or 300mg strength, or compounded.
- May interact with other drugs via rifamycin p450 cytochrome enzyme induction.
- Gives side effects to approximately 1–10% of people.

# Common Side Effects of Rif

- Rash
- Stomachache, loss of appetite, nausea and/or vomiting, and diarrhea
- Muscular weakness, fatigue, headache, dizziness, numbness
- Edema
- Flushing
- Neutropenia
- Flu-like syndrome

# Rifapentine (RPT)

- Included in the 3HP regimen.
- Available as tablets, in 150mg strength.
- Gives side effects to between 1–10% of people.

# Common Side Effects of RPT

- Headache
- Dizziness
- Rash with or without itching
- Flu-like syndrome
- Acne
- Loss of appetite, nausea and/or vomiting, upset stomach, diarrhea
- Increase in blood pressure
- Neutropenia, lymphopenia and/or anemia

# Common Side Effects of RPT (continued)

- Thrombocytosis
- Elevated liver enzymes
- Arthralgia or pain
- Pyuria, proteinuria, and/or hematuria with or without urinary casts
- Hemoptysis

# Nursing Interventions

- Counsel client about potential side effects
- Contraception
- Nutrition
- Blood glucose control in diabetics
- Hydration

# Helpful Resources

- [NTCA LTBI Clinical Recommendations](#)
- [3HP Regimen Medication Tracker | Tuberculosis \(TB\) | CDC](#)
- [4R Regimen Medication Tracker | Tuberculosis \(TB\) | CDC](#)
- [3HR Regimen Medication Tracker | Tuberculosis \(TB\) | CDC](#)
- [Latent Tuberculosis Infection \(LTBI\)](#)

# Adverse Reactions

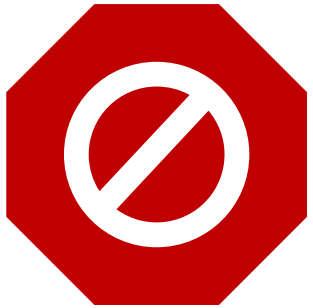
Liver Injury, Restarting Drugs, Dermatologic Reaction/  
Rash

# Liver Injury

Hepatitis signs and symptoms:

- Abdominal pain or tenderness
- Nausea
- Vomiting
- Loss of appetite
- Elevated liver enzymes
- Jaundice
- Persistently dark urine
- Unexplained fever for more than three days
- New, unexplained fatigue

# Red Flags for Liver Toxicity



**Stop all TB medications** until liver enzymes return to **less than twice the upper limit of normal** before restarting if either are true:

- **ALT is 3x or more** the upper limit of normal in the presence of hepatitis **symptoms**.
- **ALT is 5x or more** the upper limit of normal in the absence of hepatitis symptoms.

# Rifampin Hepatotoxicity



Rifampin hepatotoxicity is an adverse drug reaction (ADR) associated **with elevated Alanine Aminotransferase (ALT), and disproportionate increases in bilirubin and alkaline phosphatase.** These conditions should be evaluated promptly.

# Exclude Other Causes

Ensure the prescribing provider excludes other causes of abnormal liver function tests (LFTs):

- Hepatitis B
  - Hep B surface antigen
  - Hep B Core IgM
  - Hep B surface antibody
  - Hep B PCR/DNA of blood
- Hepatitis A (Hep A IgM)
- Excessive use of alcohol, acetaminophen, or herbal supplements
- Pregnancy testing, if applicable
- Hepatitis C (Hep C antibody)

# Reintroduction Protocol

1. Restart **rifampin (RIF)** at full intended dose. **Take daily for 4–5 days**, recheck signs and symptoms (hepatic panel function testing) if still within normal limits (WNL), then start next drug (step 2).

# Reintroduction Protocol

2. Add in **isoniazid (INH)**. Take daily for **4–5 days**, recheck signs and symptoms (hepatic panel function testing) if still WNL, then start next drug (step 3\*).

# Reintroduction Protocol

2. Add in **isoniazid (INH)**. Take daily for 4-5 days, recheck signs and symptoms (hepatic panel function testing) if still WNL, then start next drug (step 3\*).

**\*Do not restart pyrazinamide (PZA) and skip to step 4 if rifampin and isoniazid were tolerated, this likely indicates PZA was causative. Also do not restart PZA if the patient is suspected or know to have *m. Bovis* TB or PZA resistant TB).**

# Reintroduction Protocol

3. Add in **pyrazinamide (PZA)**. Take daily 4–5 days, recheck signs and symptoms (hepatic panel function testing) if still WNL, then start next drug (step 4).

# Reintroduction Protocol

3. Add in **pyrazinamide (PZA)**. Take daily 4–5 days, recheck signs and symptoms (hepatic panel function testing) if still WNL, then start next drug (step 4).
4. Add in **ethambutol (EMB)**.

# Reintroduction Protocol

3. Add in **pyrazinamide (PZA)**. Take daily 4–5 days, recheck signs and symptoms (hepatic panel function testing) if still WNL, then start next drug (step 4).
4. Add in **ethambutol (EMB)**.
5. Continue regimen per [CDC/ ATS Treatment Guidelines for drug susceptible TB](#).

# Resources and References: Liver Injury

- [An Official ATS Statement: Hepatotoxicity of Antituberculosis Therapy](#)
- [CDC/ ATS Treatment Guidelines for drug susceptible TB](#)
- [Heartland TB Center, TB: Medications Key Side Effects and Toxicities \(New, ONLINE ONLY\)](#)

# Dermatologic Reaction/ Rash



Rashes and dermatologic reactions may be an indicator of a drug allergy causing anaphylaxis or other severe, life-threatening reactions (Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS), Stevens-Johnson Syndrome). It is imperative to assess at once for red flags of serious reactions requiring immediate medical attention.

# Red Flags for Rashes



If your patient has **any of the following** new signs and symptoms and a new dermatologic reaction/rash, they should **go to the emergency department for evaluation without delay:**

- Fever
- Mucosal involvement
- Painful rather than pruritic (itchy) skin
- Epidermal detachment or blistering (peeling, flaking)
- Organ involvement

# Ask Your Patient These Questions



If any of the following questions (next two slides) result in a “yes” answer, the patient should:

- Go to the emergency department for evaluation without delay.
- Stop taking their TB, LTBI, or new medications until further instructions from their provider.

# Ask Your Patient These Questions



- Are you having any shortness of breath or trouble breathing?
- Are your lips, eyes, eyelids, ears, or face swollen?
- Is there a noise in your throat or chest when you try to breath in or out (wheezing)?
- Is the inside of your mouth sore, itchy, or red?
- Are your eyes irritated or red?

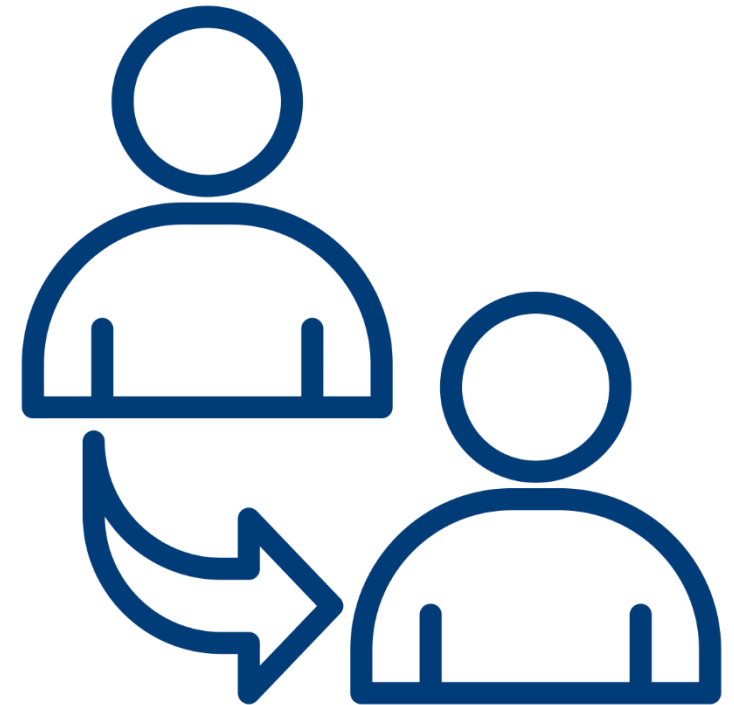
# Ask Your Patient These Questions



- Are you having any abdominal pain or diarrhea?
- Are there any blisters or peeling of your skin?
- Is your heart rate much faster than usual?
- Are you having irregular heart rate, feeling palpitations or skipped beats?
- Is your blood pressure much lower than usual?

# Suspicion of Drug Allergy or Complex, Severe Rash

After provider evaluation, if the person **was suspected of having an allergy** to one to the TB medications, they will likely need a **referral to a local allergist** for aid in safely restarting their medications.



# Standard Approach to Simple, Non-Severe Rash

After provider evaluation, if the person was **not suspected of having a true allergy**, and is diagnosed with a **simple, non-severe derm reaction** in the absence of red flags for systemic involvement/ allergy, the prescribing provider may opt for dual histamine blockade.

# Example Antihistamines

- Cetirizine 10 mg tab twice daily for 7 days, then once daily for 21 days.
- Famotidine 20 mg twice daily for 7 days; then 20 mg once daily for 21 days.

If there is no response after several days, prescribing provider may opt for prednisone 20 mg tablet: 2 tabs by mouth once daily for 5 days.

# Resources and References: Derm Reaction/ Rash

- [Rash-Assessment and Description Guide](#), Heartland National TB Center, 2022.
- [Nursing Guide for Managing Side Effects to Drug-resistant TB Treatment](#), CITC and International Council of Nurses (ICN).
- [Core Curriculum on Tuberculosis: What the Clinician Should Know](#), CDC, 2021.

# Dose Counting

Verifying Treatment Completion for Active Disease

# Treating TB Disease

Intensive phase may contain the following four drugs:

- Isoniazid (INH)
- Rifampin (RIF)
- Pyrazinamide (PZA)
- Ethambutol (EMB)



Example of pills used to treat TB disease. From left to right: isoniazid, rifampin, pyrazinamide, and ethambutol

# Common Regimens

Intensive phase	Continuation phase	Comments
<p>7 doses/week for 56 doses (8 weeks), or</p> <p>7 doses/week for 14 doses (2 weeks) then 5 doses/week for 30 doses (6 weeks)</p>	<p>5–7 doses/week for 18-31 weeks (130-182 doses)</p>	<p>Preferred regimen for patients with new pulmonary TB.</p>
<p>7 doses/week for 56 doses (8 weeks), or</p> <p>7 doses/week for 14 doses (2 weeks) then 5 doses/week for 30 doses (6 weeks)</p>	<p>3 doses/week for 18–31 weeks (94–110 doses)</p>	<p>Preferred alternative regimen for situations in which frequent DOT is difficult to achieve</p>

# Directly Observed Therapy (DOT)

Prevents detention and quarantine by chemical quarantine thereby reducing the risk to the public—allows outpatient treatment.

The responsibility for successful TB treatment is on the clinician **not** the patient!



# What Determines Completion of Treatment?

**Number of DOT doses**  
within a specified time frame  
(duration).

Duration depends on:

- Site of disease
- Drugs used
- Susceptibility results
- Patient's clinical response





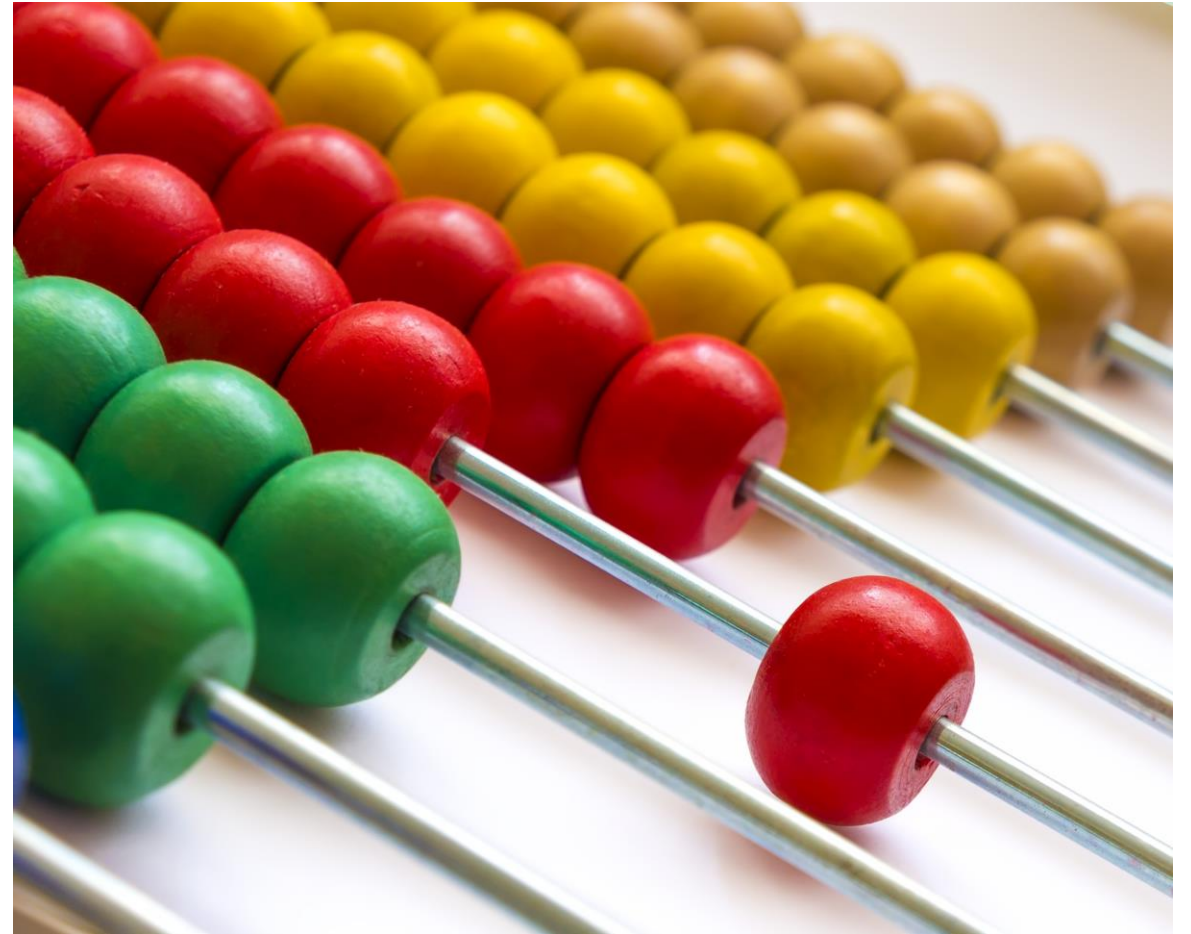
Only DOT doses may be counted. Self-administered (SAT) doses do **not** count towards completion of therapy.



# Counting DOT Doses

For both intensive and continuation phase:

- First calculate the "**goal**" using planned regimen frequency and duration.
- **Compare with actual** DOT doses completed.
- **Check PZA** doses.



# Note About Durations

- **6 months= 26 weeks**
  - 8 weeks intensive phase
  - 18 weeks continuation phase
- **9 months= 39 weeks**
  - 8 weeks intensive phase
  - 31 weeks continuation phase



# Example



Client was started on RIPE for drug-susceptible TB disease. Your department planned on giving in person DOT for the first two weeks and then transitioning to five days a week DOT/eDOT for the remaining therapy. The provider anticipates six months of therapy. Client is asking when he would finish treatment?

# 1. Calculate Goal Dose

Intensive phase (8 weeks):

2 weeks x 7 days/week DOT = 14 DOT doses

Plus

6 weeks x 5 days/week DOT = 30 DOT doses  
= 44 DOT doses total

# 1. Calculate Goal Dose

Intensive phase (8 weeks): = 44 DOT doses total

Continuation phase (18 weeks):  
18 weeks x 5 days/week DOT = 90 DOT doses

How many total DOT doses = 44 + 90  
for the full treatment? = **134 DOT doses**

## 2. Compare with DOT doses Completed

Client was started DOT on 1/27/26. He missed a week during the intensive phase (2/15–2/21) due to elevated ALTs but completed 44 doses on 3/31.

He missed a few DOT sessions due to work schedule conflicts but now has 40 DOT doses in the continuation phase as of 5/26.

When might he finish?

## 2. Compare with DOT doses Completed

Intensive phase: 44 out of the 44 goal doses completed.

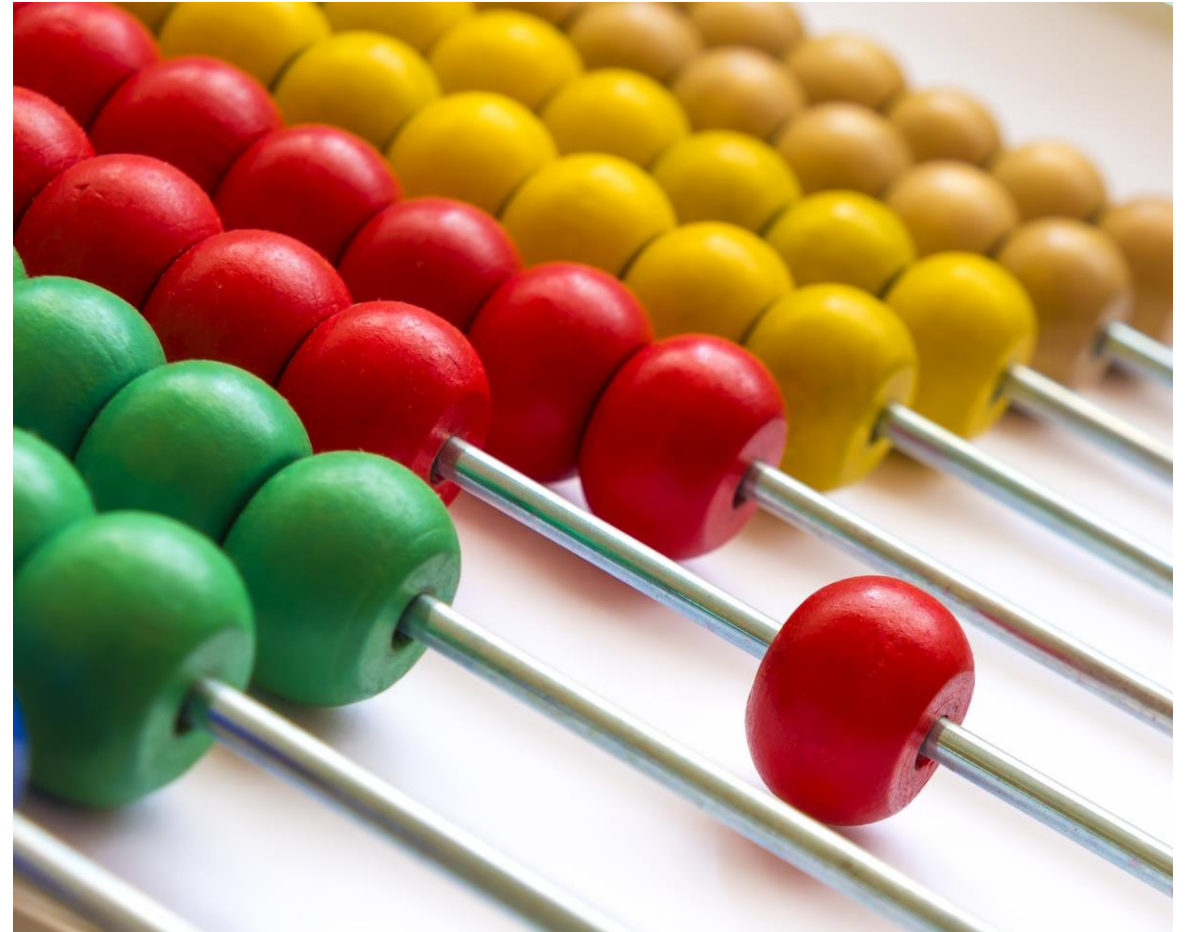
Continuation phase: 40 out of the 90 goal doses completed.

$90 - 40 = 50$  DOT doses left. At 5 days/week DOT, that would be 10 weeks left from 5/26, or 8/4 anticipated date of completion.

# Counting DOT Doses

For both intensive and continuation phase:

- First calculate the "**goal**" using planned regimen frequency and duration.
- Compare with actual DOT doses completed.
- **Check PZA doses.**



# 3. Check PZA doses

Intensive phase: 44 out of the 44 goal doses completed.

All 44 DOT doses included PZA.

If PZA doses missed (due intolerance, availability, etc.), provider may extend duration to nine months, or 39 weeks.

# Words of Wisdom

- Don't make promises you can't keep—keep the end of treatment approximate.

# Words of Wisdom

- Don't make promises you can't keep—keep the end of treatment approximate.
- Be aware of interruptions in therapy that may extend duration or restart treatment.

# Interruptions

[Official American Thoracic Society/Infectious Diseases Society of America/Centers for Disease Control and Prevention Clinical Practice Guidelines: Diagnosis of Tuberculosis in Adults and Children \(2016\)](#)

Table 6. Management of Treatment Interruptions<sup>a</sup>

[Open in new tab](#)

Time Point of Interruption	Details of Interruption	Approach
During intensive phase	Lapse is <14 d in duration	Continue treatment to complete planned total number of doses (as long as all doses are completed within 3 mo)
	Lapse is ≥14 d in duration	Restart treatment from the beginning
During continuation phase	Received ≥80% of doses and sputum was AFB smear negative on initial testing	Further therapy may not be necessary
	Received ≥80% of doses and sputum was AFB smear positive on initial testing	Continue therapy until all doses are completed
	Received <80% of doses and accumulative lapse is <3 mo in duration	Continue therapy until all doses are completed (full course), unless consecutive lapse is >2 mo. If treatment cannot be completed within recommended time frame for regimen, restart therapy from the beginning (ie, restart intensive phase, to be followed by continuation phase) <sup>b</sup>
	Received <80% of doses and lapse is ≥3 mo in duration	Restart therapy from the beginning, new intensive and continuation phases (ie, restart intensive phase, to be followed by continuation phase)

Abbreviation: AFB, acid-fast bacilli.

# Words of Wisdom

- Don't make promises you can't keep—keep the end of treatment approximate.
- Be aware of interruptions in therapy that may extend duration or restart treatment.
- Missed DOT doses made up at end of phase—increasing frequency of DOT to shorten therapy may not help.

# Make Up Doses

A new medication order may be needed if interruptions prolong treatment: [F-44000](#).

Fill out first page with medication and number of doses needed.

DEPARTMENT OF HEALTH SERVICES  
Division of Public Health  
F-44000 (11/2023)

STATE OF WISCONSIN  
s. 252.10 (7), Wis. Stats.  
Wisconsin Tuberculosis Program  
Telephone: 608-261-6319  
Page 1 of 2

**TUBERCULOSIS DISEASE  
INITIAL REQUEST FOR MEDICATION**

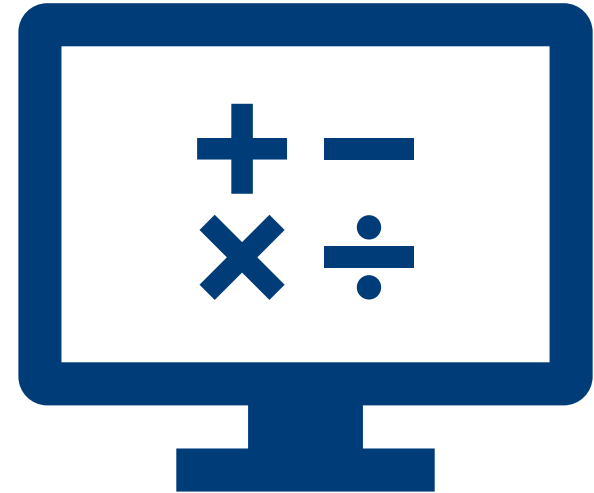
Fields marked with an (\*) asterisk are required. Please complete patient information on reverse side.  
Submit completed form to the Local Health Department.

SUBMIT COMPLETED FORM TO:		Local Health Department (LHD)		LHD Fax Number	
*Name – Patient (Last, First, Middle Initial)				*Date of Birth (mm/dd/yyyy)	
*Address (Street or Rural Route)				*Phone Number	
*City		*Zip Code	*LHD/Clinic to Send Meds		Other contact, as needed
*Sex	*Race	*Ethnicity <input type="checkbox"/> Hispanic	Non-Hispanic <input type="checkbox"/> Hispanic	*Weight kg	*Height
*Name – Clinician (Print clearly)			*Prescription Insurance Provider & Insurance No.		
*Address (Street, City, State, Zip code)				*Phone Number	
<b>*MEDICATION ORDERS</b> (Check mg/kg for patients with variable weight)					
Medication	Dose	Liquid	Frequency	Duration of Therapy	
Isoniazid (INH) (Generic only)	<input type="checkbox"/> 300 mg <input type="checkbox"/> ____ mg	<input type="checkbox"/> ____ mg/kg	<input type="checkbox"/> Daily <input type="checkbox"/> Other	<input type="checkbox"/> 6 mo	<input type="checkbox"/> 9 mo <input type="checkbox"/> Other
<i>10-15 mg/kg infants + children; 5 mg/kg adults; 300 mg maximum daily</i>					
Rifampin (Generic only)	<input type="checkbox"/> 600 mg <input type="checkbox"/> ____ mg	<input type="checkbox"/> ____ mg/kg	<input type="checkbox"/> Daily <input type="checkbox"/> Other	<input type="checkbox"/> 6 mo	<input type="checkbox"/> 9 mo <input type="checkbox"/> Other
<i>10-20 mg/kg infants + children; 10 mg/kg adults; 600 mg maximum daily</i>					
Ethambutol* † (Generic only)	<input type="checkbox"/> 800 mg <input type="checkbox"/> 1200 mg <input type="checkbox"/> 1600 mg	<input type="checkbox"/> ____ mg/kg	<input type="checkbox"/> Daily <input type="checkbox"/> Other	<input type="checkbox"/> 2 mo	<input type="checkbox"/> 6 mo <input type="checkbox"/> Other
<i>*Dosing assumes normal renal function. †Ranges based on estimated lean body weight. 20 mg/kg infants + children; 40-55 kg, 800 mg; 56 – 75 kg, 1200 mg; 76 – 90 kg, 1600 mg; long term EMB=15mg/kg</i>					
Pyrazinamide <sup>1</sup>	<input type="checkbox"/> 1000 mg <input type="checkbox"/> 1500 mg <input type="checkbox"/> 2000 mg	<input type="checkbox"/> ____ mg/kg	<input type="checkbox"/> Daily <input type="checkbox"/> Other	<input type="checkbox"/> 2 mo	<input type="checkbox"/> 6 mo <input type="checkbox"/> Other
<i><sup>1</sup>Ranges based on estimated lean body weight. 30-40 mg/kg infants + children; 40 – 55 kg, 1000 mg; 56 – 75 kg, 1500 mg; 76 – 90 kg, 2000 mg; long-term PZA=25mg/kg</i>					
<input type="checkbox"/> Vitamin B6 (pyridoxine)	____ mg	<input type="checkbox"/> Daily <input type="checkbox"/> Other	<input type="checkbox"/> 9 mo <input type="checkbox"/> Other		
<i>10 – 50 mg/day when on INH</i>					
<input type="checkbox"/> Other: _____					
<input type="checkbox"/> Other: _____					
<input type="checkbox"/> Other: _____					
<b>Standard of care:</b> All medications are given together under directly observed therapy (DOT). Medications are administered seven (7) days per week for at least the first two weeks of therapy. Then medications may be administered five (5) days per week by DOT, with the remaining two doses self-administered over the weekend. Intermittent therapy is generally not recommended. Ethambutol can be discontinued when drug susceptible to INH and RIF is demonstrated. Pyridoxine (B-6) is given with INH to those at risk of neuropathy (e.g., pregnant women, breastfeeding infants, persons infected with human immunodeficiency virus [HIV], patients with diabetes, alcoholism, chronic renal failure or malnourished and those who are of advanced age).					
<b>MONITORING ORDERS</b>					
1. Beginning with the second week of therapy, collect one sputum sample weekly and send to WSLH for smear and culture.					
2. Assess the patient at least weekly for side effects and medication toxicity. Hold medications and call clinician if present.					
<b>SIGNATURE</b>					
*SIGNATURE – Clinician: _____				* Date Prescription Ordered: _____	
WEDSS Disease Incident Number			Ship medication to:		
Pharmacy: <input type="checkbox"/> TB Dispensary Pharmacy <input type="checkbox"/> Other, List					

# Words of Wisdom

Can use online "between dates" calculator to do a quick check:

[Date Calculator: Add to or Subtract From a Date – Results](#)



# Finally...

Don't be afraid to ask another person to double check your math!



# Encouraging Adherence

Leveraging Resources

# Who Is Responsible for Completion of Treatment?

The responsibility for successful TB treatment is on the clinician **not** the patient!





# What If Client Isn't Engaged In Care?



# First, Know Your Client

"It is much more important to know what sort of patient has a disease than what sort of disease a patient has."

-Sir William Osler

# Questions to Ask



- What are their biggest worries? (It might not be TB!)
- What is their understanding of TB?
- What motivates them to protect their health?
- Other barriers to care?

# Second, Address Intolerances Promptly

- Be comfortable with common nursing interventions.
- Know potential side effects and drug-drug interactions.
- Coordinate with specialists as needed.



# Third, Know Your Local Resources

- Creative options for DOT
- Referral for medical services
- Food pantries
- Emergency housing
- Utilities assistance
- Legal counsel



# Fourth, Know Your State Resources

- Wisconsin TB Dispensary for medical service costs.
- Wisconsin TB Treatment Assistance Program for non-medical essentials.
- Nursing and medical consultation.



# Learn More

["The TB dispensary and TB treatment assistance programs" \(PDF\)](#)

Wisconsin Department of Health Services



## Financial Assistance through the Wisconsin Tuberculosis Program



Financial Assistance through the Wisconsin Tuberculosis (TB) Program 2021

1

# Fifth, Know Your National Resources

- [We Are TB](#) (Spanish: Somos TB) offers support groups, run by TB survivors.



## we are TB: TUBERCULOSIS SURVIVORS & ADVOCATES

*we are TB* offers comprehensive peer support for current TB patients and TB clinics. *we are TB* is a growing survivor network that is fighting to achieve change in TB diagnostics, treatment regimens, and funding to support US-based public health programs. The group specializes in connecting medical professionals and current TB patients to TB survivors. We bring an unparalleled depth of knowledge and provide compassionate support while using personal stories to empower survivors to break the stigma.

# Only If All Attempts Fail...

Health orders in accordance with:

- Wis. Stat. § 252.07
- DHS Sec. 145 Control of Communicable Disease

Be sure that previous attempts to gain engagement are documented and provider is updated!

The background of the slide features a repeating pattern of light blue question marks inside white speech bubble shapes, set against a light blue background. The text is centered in a bold, dark blue font.

# Questions and Answers

# Contact Us



[dhswitbprogram@dhs.wisconsin.gov](mailto:dhswitbprogram@dhs.wisconsin.gov)



608-261-6319



608-266-0049



<https://www.dhs.wisconsin.gov/tb/index.htm>