

VI. TB Drugs

A. NC TB Program

1. Supplies drugs, including PPD, only to health departments
2. Contracts with a vendor to ship drugs within 24 hours of the drug order. (Note: Counties that have contracts with Cardinal for weekly drug deliveries will only receive drug orders on Wednesday)
3. Does **not** provide medications for the treatment of non tuberculosis mycobacterium (NTM)
4. Allows rifampin use for contacts to *Hemophilus influenza* and meningococcal disease. Communicable Disease (919) 733-3419 must be consulted if more than 2 bottles are needed to treat all the contacts.

B. Health Department Pharmacy

1. Maintains contract with the state vendor so TB drugs can be shipped directly to the county
2. Dispenses medications in compliance with applicable laws and health department policy
3. Labels medications for dispensing on an as needed basis. The N.C. TB Control Branch cannot return pre-labeled drugs to the pharmaceutical company for credit
4. Prepares suspension/liquid forms of rifampin, PZA or other drugs
5. Does not provide medications for the treatment of non-tuberculosis mycobacterium (NTM)
6. Does not provide PPD to other health care providers or other agencies
7. Maintains a log with patient name, lot number, manufacturer, and expiration date
8. Follows the Public Health Pharmacy Rule § G.S. 90-85.34A. (Refer to Chapter XI)

C. Drug Information

1. Purified Protein Derivative (PPD)
 - must be refrigerated during shipping
 - should be stored in refrigerator between 35°-46° F
 - should never be frozen
 - discard 30 days after opening, or if solution becomes cloudy
 - protect from light
 - If you have questions about PPD stability you should call Sonofi-Aventis (Tubersol) at 1-800-822-2463. They will need to know if the vial has been

- opened, the temperature of the room, the length of time at this temperature, and, if this was a shipment, length of transit since removal from refrigeration
- health departments are not permitted to supply PPD to any other provider
 - state provided PPD may only be used on those persons who are considered high-risk for developing TB. See Chapter II for clarification about who is at high-risk
 - locally purchased PPD should be used for low risk tuberculin skin testing

2. See Tuberculosis Biologicals Requisition & Inventory (DHHS 3093) on the next page for available medications

D. Ordering Drugs

1. Complete Tuberculosis Biologicals Requisition and Inventory form (DHHS 3093)
2. Fax orders to (919) 733-2054
3. Contracts with a vendor to ship drugs within 24 hours of the drug order. (Note: Counties that have contracts with Cardinal for weekly drug deliveries will only receive drug orders on Wednesday)
4. Orders shipped from Cardinal Health are delivered by commercial carrier and require a signature upon receipt
5. The Cardinal invoices shipped with the TB biologicals are to be documented as "received" and initialed by an agency representative. Any missing TB biologicals are to be noted on the invoice. Then call the Field Development Unit at (919) 733-2030 to report the missing TB biologicals.
6. The original Cardinal invoice is required for payment. It should be signed and mailed within 1-3 business days to:

DHHS/Division of Public Health
Epidemiology Section, Communicable Disease Branch
Field Development Unit
1933 Mail Service Center
Raleigh, NC 27699-1933
7. All expired TB biologicals should be returned to the Field Development Unit at the above address.
8. Do not order drugs more than once per month except in emergencies.
9. All drugs except INH, RIF, PZA, and EMB must have approval from a TB Nurse Consultant or Medical Director before it can be shipped

E. TB Biologicals Requisition and Inventory Form (DHS 3093)

Name of Department _____

N.C. Department of Health and Human Services
Division of Public Health
Epidemiology Section • TB Control

Shipping Address _____

City, State, Zip _____

Tuberculosis Biologicals Requisition and Inventory

Account Number _____

	1	2	3		
Quantity On Hand	Earliest Expiration Date	Quantity Ordered	Unit Size	Drug Name and Strength	Item Number
btl		btl	100 tabs/btl	Isoniazid Tablets 100 mg.	
btl		btl	30 tabs/btl	Isoniazid Tablets 300 mg.	
btl		btl	480 mL/btl	Isoniazid Syrup 50 mg./5mL	
btl		btl	60 caps/btl	Rifampin Capsules 300 mg.	
btl		btl	30 caps/btl	Rifampin Capsules 150 mg.	
btl		btl	60 caps/btl	Rifamate Capsules (RIF 300 mg/INH 150 mg.)	
btl		btl	60 tabs/btl	Pyrazinamide Tablets 500 mg.	
btl		btl	90 tabs/btl	Pyrazinamide Tablets 500 mg.	
btl		btl	100 tabs/btl	Ethambutol Tablets 100 mg.	
btl		btl	100 tabs/btl	Ethambutol Tablets 400 mg.	
btl		btl	30 tabs/btl	Pyridoxine Tablets 25 mg. (B ₆)	
btl		btl	100 tabs/btl	Pyridoxine Tablets 25 mg. (B ₆)	
btl		btl	100 tabs/btl	Pyridoxine Tablets 50 mg. (B ₆)	
vial		vial	1 mL/vial	Pyridoxine Injectable 100 mg/mL (B ₆)	
vial		vial	10 test/vial	Tuberculin PPD – Intermediate Strength	
vial		vial	50 test/vial	Tuberculin PPD – Intermediate Strength	
vial		vial	15 mL/vial	Sodium Chloride 3%	
Special Orders (all require prior approval):					
vial		vial	1 each	Amikacin Sulfate Inj. 250 mg./mL	
vial		vial	1 each	Capreomycin Injection 1 gm.	
box		box	100 tabs	Cipro Tablets 250 mg.	
box		box	100 tabs	Cipro Tablets 500 mg.	
box		box	50 tabs	Cipro Tablets 750 mg.	
btl		btl	100 mL/btl	Cipro 250 mg./5 mL (5% Oral Suspension)	
btl		btl	40 caps/btl	Cycloserine Capsules 250 mg.	
btl		btl	100 tabs/btl	Ethionamide Tablets 250 mg.	
vial		vial	1 each	Kanamycin Injection 1 gm	
btl		btl	1x480mL	Levaquin 25 mg./mL (Oral Solution)	
btl		btl	50 tabs/btl	Levaquin Tablets 250 mg.	
btl		btl	30 each	Moxifloxacin 400 mg.	
pk		pk	30 each	Paser Granules (PAS) 4 gm. (min. order–2 pks)	
btl		btl	100 caps/btl	Rifabutin Capsules 150 mg.	
blstrpks		blstrpks	32 each	Rifapentine 150 mg.	
vial		vial	1 gm/vial	Streptomycin 1 gm.	

Ordered By: _____ Date _____

- Purpose:
1. For local health departments to order drugs for the prevention and treatment of tuberculosis.
 2. Account for the inventory of tuberculosis drugs stored at the health department.

Preparation: This form is to be prepared by the health department representative responsible for ordering tuberculosis drugs. The identifying information requested in the upper left corner of the form must include the street address where shipment is to be made.

Instructions:

For each drug being ordered:

- A. In column 1, enter the number of containers of the drug presently in inventory at the health department.
 Enter in column 2 the earliest expiration date of the drug in inventory.
 Enter in column 3 the quantity ordered.

To determine the quantity to order for the most commonly used tuberculosis medicines, the following steps are suggested:

1. Determine the number of patients who are to receive the particular drug.
2. Based on the number of patients to receive the drug, use the following table to determine the drug reserve.

Drug Reserve—INH, B ₆	Extra Bottles	Drug Reserve—EMB., RIF., PZA	Extra Bottles
# Pts./Mo.		# Pts./Mo.	
1–10	5	1–10	2
11–20	10	11–20	5
21–40	15	21–40	8
41–60	20	41–60	10
61–100	25	61–100	12
100	30	100	15

3. Add the number of patients and the drug reserve to determine the monthly need.
 For example, if a health department has 10 patients who are to receive Isoniazid 300 mg., then the drug reserve is 5. Therefore, the monthly need is 15.
4. Subtract “monthly need” from “quantity on hand” to determine “quantity ordered.”

Enter the signature of the person placing the order and the date of the order.

Fax the completed order form to: Field Development Unit
(919) 733-2054

- B. Return expired drugs to: DHHS / Division of Public Health
 Field Development Unit
 Epidemiology Section / Communicable Disease Branch
 1933 Mail Service Center
 Raleigh, NC 27699-1933
 Telephone: (919) 733-2030

Distribution: Fax original to (919) 733-2054. Keep the original copy for health department records.

Disposition: This form may be destroyed in accordance with the Budget and Fiscal Records section of the *Records Disposition Schedule* published by the Division of Archives and History.

To download TB forms go to www.epi.state.nc.us/epi/tb

F. Common Drug Interactions with Tuberculosis Medications ¹

Tuberculosis Medication	Drug or Drug Type	Interaction
Isoniazid (INH)	Acetaminophen	Increased toxic metabolites
	Antacids	Decreased INH absorption
	Anticoagulants (oral)	Increased anticoagulant effect
	Benzodiazepines	Increased benzodiazepines toxicity
	Carbamazepines	Increased toxicity of both drugs
	Cycloserine	Increased CNS effect of cycloserine
	Disulfiram	Severe psychotic episodes
	Enflurane	Increased nephrotoxicity
	Haloperidol	Increased haloperidol toxicity
	Ketoconazole	Decreased ketoconazole effect
	Phenytoin	Increased phenytoin toxicity
	Theophyllin	Increased theophyllin toxicity
	Valproate	Increased hepatic and CNS toxicity
Rifampin (RIF)	Aminosalicylic acid	Decreased RIF absorption
Rifabutin	Anticoagulants (oral)	Decreased anticoagulant effect
Rifapentine	Antidepressants	Decreased anticoagulant effect Tricyclic, barbiturates, benzodiazepines
	Beta-adrenergic blockers	Decreased beta blockade
	Metoprolol	Possible increased beta blockade
	Chloramphenicol	Decreased chloramphenicol effect
	Clofibrate	Decreased clofibrate effect
	Contraceptives	Decreased contraceptive effect
	Corticosteroids	Marked decreased corticosteroid effect
	Cyclosporine	Decreased cyclosporine effect
	Dapsone	Possible decreased dapsone effect
	Delavirdine	Marked decreased delavirdine effect
	Digitoxin	Decreased digitoxin effect
	Digoxin	Decreased digoxin effect
	Diltiazem	Decreased diltiazem effect
	Disopyramide	Decreased disopyramide effect
	Fluconazole	Decreased fluconazole effect
	Haloperidol	Decreased haloperidol effect
	Itraconazole	Decreased itraconazole effect
	Mephenytoin	Decreased mephenytoin effect
	Mexiletin	Decreased antiarrhythmic effect
	Methadone	Decreased methadone effect
	Nefedipine	Decreased antihypertensive effect
	Nesoldepine	Decreased antihypertensive effect
	Phenytoin	Decreased phenytoin effect
	Progesterone	Decreased progesterone effect

Tuberculosis Medication	Drug or Drug type	Interaction
Continued: Rifampin	Propaferrone Protease inhibitors (PI)	Decreased propaferrone effect Marked increase serum levels of Rifabutin RIF and marked decreased serum levels in PI
Rifapentine	Quinidine Sulfonylurea Tetracyclines Theophyllines Tocainide Trimethrprim-sulfamethoxazole Verapamil	Decreased quinidine effect Decreased sulfonylurea effect Decreased tetracycline effect Decreased theophylline effect Possible increased tocainide effect Possible rifampin toxicity Decreased verapamil effect
Aminoglycoside	Amphotericin Bumetanide Capreomycin Cephalosporins Cisplatin Cyclosporines Enflurane Ethacrynic acid Furosemide Gallium Methotrexate Neuromuscular blocker Vancomycin	Nephrotoxicity (synergism) Increased ototoxicity Increased ototoxicity and nephrotoxicity Increased nephrotoxicity Increased nephrotoxicity Increased nephrotoxicity Possible increased nephrotoxicity Increased ototoxicity Increased ototoxicity and nephrotoxicity Increased nephrotoxicity Possible increased methotreate toxicity with kanamycin Increased neuromuscular blockade Increased ototoxicity and nephrotoxicity
Pyrazinamide	Allopurinol	Failure of allopurinol to decrease serum uric acid level
Pyridoxine	Barbiturates Levodopa Phenytoin	Decreased Barbiturate effect Decreased levodopa effect Decreased phenytoin effect
Cycloserine	Alcohol Isoniazid Ethionamide	Increased alcohol effect & seizures Increased CNS effect of cycloserine Increased CNS effect of cycloserine
Quinolones	Antacid with metal cations (Ca, Mg, Al, Fe) Sucralfate Probenecid	Reduced absorption of quinolones Reduced absorption of quinolones Increased serum level of quinolone

Tuberculosis Medication	Drug or Drug type	Interaction
Quinolones continued	NSAIDS Drugs metabolized By cytochrome P450 (cyclosporine, theophyllin, warfarin, phenytoin, sulfonyleurea	Increased CNS stimulation and possible convulsions Increased action of additional drug
Para-aminosalicylic Acid (PAS)	Digoxin	Possible decreased digoxin action
Cycloserine	Isoniazid Ethionamide	Increased CNS effect Increased CNS effect of cycloserine
Ethionamide	Cycloserine	Increased CNS effect of cycloserine

¹ Clinical Policies and Protocols, Bureau of Tuberculosis Control, New York City Department of Health. Appendix F, pg.109

For in-depth information about TB drugs please refer to Centers for Disease Control and Prevention. Treatment of Tuberculosis, American Thoracic Society, CDC, and Infectious Diseases Society of America. MMWR 2003;52 (NO. RR-11):19-32

There is also a Web site for clinicians treating tuberculosis in patients taking certain antiretroviral drugs for HIV infection. The site can be accessed at http://www.cdc.gov/nchstp/tb/TB_HIV_Drugs/TOC.htm. The site is entitled *Updated Guidelines for the Use of Rifamycins for the Treatment of Tuberculosis Among HIV-Infected Patients Taking Protease Inhibitors or Nonnucleoside Reverse Transcriptase Inhibitors*

G. TB Drug Abbreviations

Drug	Abbreviation
Isoniazid	INH
Rifampin	RIF
Rifabutin	RBT
Rifapentine	RPT
Pyrazinamide	PZA
Ethambutol	EMB
Streptomycin	SM
Cycloserine	CIS
Kanamycin	KM
Ethionamide	THA
Capreomycin	CAP
Ciprofloxacin	CIP
Amikacin	AK
Para-aminosalicylic acid	PAS