TITLE: LTBI - Initiating and Managing Treatment through DOH TB Clinics		
CHAPTER 2 Clinical	CONTACT PERSON/S: M.A Ware MD	NUMBER: 2.020
APPROVED BY: Elizabeth MacNeill, MD-MPH Chief, TB Branch	Date Approved: 8-7-2018 Date Initiated: 10-07-2011 Last Revised: 8-7-2018	
APPLIES TO: DOH TB Physicians (TBCMD)		

Purpose

Persons treated by DOH TB Branch (TBB) for latent TB infection (LTBI) will be:
- Safely treated (includes attention to potential drug interactions)
- Treated with approved regimens with the fewest barriers to completion based on individual circumstances

TABLE OF CONTENTS

RELATED P&P

2.009 DOH TB Classification system	
2.016 Dose Tables and Administration of Anti-TB Medication	
2.018 Virtual DOT	
2.019 LTBI TX -Nurse Assessment and Management of Adverse Drug Reactions	
2.031 CI – Window Period Treatment - *pending*	
RELATED FORMS	
TB-3 Medical History	PHI – Release of Information
TB-8 Radiology Report	TBN-04 PCP LTBI treatment outcome
TB-13 DOT/DOPT Log	TBN-34 Return to Clinic Letter (Lanakila)
TB-17 LTBI Treatment Flow Sheet (with agreement)	TBCMD-09 PCP Letter Initiation Treatment LTBI
TB-19 DOPT agreement	Completion card 5M77
TB-23 3-HP Log/Flow Sheet (with agreement)	
RELATED SOURCE DOCUMENTS (SD) AND PATIENT HANDOUTS (PH)	
SD-17 Tips on Administering Treatment to Children	
SD-29 Managing Adverse Drug Effects of Antimycobacterial Agents	
SD-32 Rifampin Drug Interactions	
SD-42 Heartland TNF antagonists	
PH-9 Meds for Treatment of TB Infection (LTBI)	

1. **GENERAL COMMENTS**
   - **Diagnosis of LTBI is based on a TB evaluation**
     - Class 2 is LTBI; Class 4A is untreated LTBI [1] *see 2.009*
     - TBCMD determines if TB diagnosis is Class 2 *or* Class 4A based on CXR and history of treatment
   - **What about BCG vaccination and TST?**
     - "TST in persons vaccinated with BCG should be interpreted using the same criteria for those not BCG vaccinated"[2]
     - Some Pts may not accept that a (+)TST indicates TB infection, because they have been taught in their country of origin that BCG will cause a (+)TST
     - IGRA blood test can be considered if a Pt agrees to treatment if IGRA is positive indicating TB infection; TB nurse check with TBCMD as volume of IGRA tests is limited through DOH
   - **"Rifamycin"** is a class of antibiotics including rifampin, rifapentine and rifabutin
   - **Consultation with TBCMD**
     - Pts can be seen by TB nurse and TBCMD at the same appointment for LTBI treatment initiation
     - Pts can be seen by TB nurse, and treatment deferred until TBCMD can review medical record on-site; note that some Pts will not see TBCMD when initiating treatment for LTBI
     - The following Pts should be scheduled to see TBCMD in person before starting a course of treatment for LTBI: persons on hemodialysis, persons living with HIV, other immune-compromised or -suppressed persons, persons taking psychiatric meds, persons taking coumadin (blood thinner)

2. **RECOMMENDED TREATMENT REGIMENS FOR LTBI**
   - TBCMD will work with the Pt and DOH nurse to determine optimal LTBI treatment regimen based on Pt's TB risk, potential for adverse effects including hepatitis, drug interactions, co-morbidities, age, likelihood of completion of treatment, drug susceptibility of Index Pt if known and Pt preference
   - In some instances, e.g. side effects, rifabutin could be considered by TBCMD instead of rifampin

[1] CDC. "Core Curriculum on Tuberculosis: What the Clinician Should Know" 6th Edition 2013 p 112, p 126
[2] CDC Core Curriculum 2013 p69

TABLE 1 DOH RECOMMENDED LTBI TREATMENT REGIMENS		
Pyridoxine (Vitamin B6) is recommended for some Pts prescribed INH see Table 2		
Drug	**Regimen**	**Comments**
Rifampin	Daily x 4 months	• Treatment preference for adolescents (age 15 years or older) and adults treated through DOH because of potential for infection with INH-resistant bacteria, improved completion rates versus INH, and fewer side effects versus INH[3]; awaiting results of study NCT00931736[4] • Increasingly recommended for children age less than 15 years *see Special Populations, children*, awaiting results of study NCT00170209[5] • 4 months duration for children as well as adults[6] • Drug-drug interactions are common and may preclude use *see SD-32* • Intermittent treatment is not recommended for LTBI
INH	Daily or 2-3x/week [7] x 6-9 months	• Many experts recommend 9 months of INH as first-line treatment of LTBI • 6 months of treatment provides substantial protection against developing TB disease, but it is less protective than the 9-month regimen • 6 month regimen may be more cost-effective and result in greater adherence by patients[8] • For TBCMD: if prescribing INH, recommend 9 months for Pts age < 15 years, Class 4A Pts and PLWH, and 6 months for others prescribed INH • Intermittent INH (2-3x/week) must be given DOPT *see Section 4*
INH and Rifampin	Daily x 3-4 months	Some experts recommend this regimen for Class 4 adults with no history of treatment[9] *see "Special Populations", Class 4A*
3 HP	INH and rifapentine 1x/week x 12 doses	• Relatively new regimen with high efficacy[11] • Currently recommended as DOPT *see Section 4* • OK for children age 2 years or older [12] • Large pill burden and requirement for DOPT can limit Pt acceptance

TABLE 2 WHO SHOULD TAKE PYRIDOXINE (VITAMIN B6) WITH INH?[13]		
INH can cause neuropathy which can be blocked by pyridoxine (vitamin B6) see 2.016 for dosing		
Patents in the following groups should take pyridoxine with INH		
• Advanced age (>75 years)	• Dialysis / CKD	• Malnutrition
• Alcoholism	• Diabetes	• Pre-existing peripheral neuropathy
• Cancer	• HIV (PLWH)	• Patient request
• Children on meat & milk-deficient diets including exclusively breast fed infants	• Taking drugs for immune-suppression	• Women: pregnant, post-partum and nursing moms

[3] Horsburgh, DR et al. "Latent Tuberculosis Infection in the United States" N Engl J Med 2011;364: p 1447
[4] https://clinicaltrials.gov/ct2/show/NCT00931736
[5] https://clinicaltrials.gov/ct2/show/NCT00170209
[6] Ahmed, Amina, "Treatment of Tuberculosis Infection in Children" p 286 in Handbook of Child and Adolescent Tuberculosis, 2016 Oxford University Press, editors Starke, JR, Donald PR.
[7] CDC. Targeted tuberculin testing and treatment of latent tuberculosis infection. MMWR 2000;49(No. RR-6) p 2-3
[8] CDC Core Curriculum 2013 p 119
[9] Horsburgh, DR et al. N Engl J Med 2011;364: p 1445
[11] Jereb, J., et al. (2011). "Recommendations for use of an Isoniazid-Rifapentine regimen with direct observation to treat latent Mycobacterium tuberculosis infection." MMWR Morb Mortal Wkly Rep 60(48):1650-1653
[12] American Academy of Pediatrics. Tuberculosis, Kimberlin et al editors. "Red Book: 2018 Report of the Committee on Infectious Diseases" p 839
[13] Same as section 2 of P&P 2.016 "Pyridoxine"

3. **DOSING** – *see 2.016 Dose Tables and Administration of Anti-TB Medication*

4. **DIRECTLY OBSERVED PREVENTIVE THERAPY (DOPT)**

TABLE 3 INDICATIONS FOR DOPT
• **Contacts** age less than 5 years on LTBI treatment or window treatment *see P&P 2.031* • **Intermittent treatment regimens** – Intermittent treatment with INH e.g. 2x or 3x/weekly must be given DOPT: either in clinic, delivered to specified address by DOH staff, or as virtual DOPT *see P&P2.018* – 3HP (weekly INH and Rifapentine x 12 weeks) is currently recommended as DOPT

- Standard DOPT for daily regimens is 5/X week plus holiday SAT, weekend SAT optional
- Treatment Agreement for children on DOPT is TB-21 separate from the log
- Treatment agreement for 3HP DOPT is on the TB-22 Log

5. **SPECIAL POPULATIONS**
   - **Breastfeeding Pts**
     - Not a contraindication for treatment with INH or rifampin even if the infant is also on medication
     - Give pyridoxine with INH to breast feeding women and exclusively breast-fed babies *see Table 2*
   - **Children**
     - Risk of progression from LTBI to TB disease is greatest in infants, decreases when children are 5–10 years of age, and increases again adolescence[14]
     - Use DOPT for LTBI treatment for contacts age less than 5 years to optimize adherence *see Table 3*
       - Also recommended for children on Window Period Treatment *see P&P 2.031*
     - Administering medication to child can be challenging see *SD-17 "Tips on Administering Treatment to Children"*
     - Advise parents that it may take several weeks for families to learn to give and take treatment
     - Recommended regimens for children
       - Red Book[15]: INH x 9 months (6 months "acceptable"); 3HP (age at least 2 years or older, some experts prefer age 5 or older); rifampin x 4 months is "acceptable"
       - Completion rates for rifampin are superior to those for INH
       - 3HP is not recommended for children age < 2 years [16]
       - The dose of medication for children is based on weight, and may change during treatment
       - Give pyridoxine with INH to exclusively breast-fed babies
       - *See 2.016* for dosage of medication for children
   - **Chronic Hepatitis B or Hepatitis C** [18]
     - TBCMD will order baseline LFTs for Pts prescribed INH who have chronic hepatitis A or B
     - Elevated baseline AST may be a risk factor for developing LFT elevation greater than five times the upper limit of normal when INH is used for treatment LTBI
     - Presence of e antigen may be a risk factor for increased incidence of isoniazid hepatotoxicity
     - Two studies showed no independent isoniazid hepatotoxicity risk associated with chronic hepatitis C
     - Low rate of hepatotoxicity associated with treatment of LTBI with rifampin awaits confirmation

---

[14] Cruz, AT et al (2014). "Old and new approaches to diagnosing and treating latent tuberculosis in children in low-incidence countries." Current opinion in pediatrics 26 (1):106-113

[15] Kimberlin, DW et al, eds. *Red Book: 2018 Report of the Committee on Infectious Diseases*. 31st ed. Itasca, IL: American Academy of Pediatrics: 2018 p841 - 845

[16] CDC Core Curriculum 2013 p 121

[18] Saukkonen, J. J., et al. (2006). "An official ATS statement: hepatotoxicity of antituberculosis therapy." American Journal of Respiratory and Critical Care Medicine **174**(8): 935-952.

- **Chronic kidney disease (CKD)/Dialysis**
  - INH and rifampin can be used at usual doses on usual schedule for Pts on dialysis
  - INH and rifampin are metabolized through the liver and are not significantly removed by dialysis[19]
  - Rifapentine has not been studied in patients on hemodialysis[20]
    - Give 3HP after dialysis
    - Try to give treatment on a day that will allow the drugs to stay in their system as long as possible: example- give 3HP on a Friday since next dialysis is not until next Monday
- **Class 4A** (TB not clinically active & no previous treatment)
  - Treatment options include the following:
    - Rifampin with or without INH for 4 months
      - NOTE: some international programs accept 3 months of treatment with INH and Rifampin as complete treatment
    - INH for 9 months
    - 3 HP regimen - Rifapentine and INH for 3 months (12 doses)
  - When discharging Class 4 A Pts who have completed treatment as prescribed, discharging nurse is authorized to change the Pts classification to Class 4B *see Table 9*
  - NOTE: Pts receiving empiric treatment with RIPE as TB suspect (Class 5A) who are TB PCR/culture negative and do not improve after 2 months of treatment are considered adequately treated for LTBI *see 2.009 Figure 1*
- **Diabetes**
  - Some anti-diabetic medications interact with the rifamycins reducing efficacy for diabetes control
  - Consider checking blood glucose and/or hemoglobin A1c in clinic as an incentive for Pts with concerns who are taking a rifamycin
  - Consider notifying PCP or this interaction
- **HIV co-infection (persons living with HIV – PLWH)**
  - Check **drug interactions** with rifamycins if patient taking ART (anti-retroviral treatment)
  - If Pt on treatment for HIV (ART), then 9 months of INH is recommended, do not use rifampin
  - If Pt not on ART, then 3HP, 4 months of rifampin, or 9 months of INH is recommended
- **Persons taking other medications**
  - Review potential drug interaction before prescribing INH or a rifamycin (rifampin/ rifapentine)[21]
  - Rifamycins stimulate liver metabolism of many drugs and thereby reduce their efficacy *see SD-32*
- **Pregnant Pts**
  - In general, delay LTBI treatment until 3 months post-partum because of the risk for hepatotoxicity during pregnancy and the immediate postpartum period, especially with INH; exceptions to postponement include
    - Pregnant women living with HIV
    - Recently infected pregnant women such as case contacts or skin test converters
    - Pregnant women with diabetes[22]
  - 3 HP (INH –rifapentine) is not recommended during pregnancy (lack of data)
  - If indicated, INH and/or rifampin can be given safely at any stage of pregnancy
  - Supplemental pyridoxine (B6) is recommended with INH treatment during pregnancy
  - Monitor liver function on a monthly basis

---

[19] Am J Respir Crit Care Med Vol 174. pp 935–952, 2006

[20] INH and Rifapentine Treatment for LTBI: Expert Opinions About 3HP A National Webinar accessed 5/14/2018 http://www.currytbcenter.ucsf.edu/sites/default/files/course-material/%5Bnid%5D/3hp_webinar_slides.pdf

[21] Standard reference: Facts and Comparisons on line (requires ID and password from pharmacy)

[22] CDC Core Curriculum 2013 p128

- Women who become pregnant during treatment - unless higher risk as above, OK to stop treatment and resume 3 months postpartum

- **Tumor necrosis factor (TNF) alpha antagonist treatment** *see SD-42*
  - Treatment for LTBI should start **BEFORE** TNF-alpha antagonist treatment is initiated.
  - CDC recommends considering postponing TNF-alpha antagonist Tx until completion of LTBI Tx
  - More recent publications suggest delaying TNF-alpha antagonist treatment until one month after the start of LTBI treatment
- **Women of child-bearing age**
  - Use of rifamycins is not usually advisable for women taking hormonal contraception because of drug interactions and reduced efficacy of contraception which may lead to unintended pregnancy
  - Hormonal contraception includes pills, injections and patches
- **Re-exposure to TB after treatment of LTBI or TB disease**
  - The risk for TB disease is not known for persons treated for LTBI or TB disease who are re-exposed to TB
  - Currently no mechanism exists to identify re-infection (without TB disease)
  - In most cases, treatment following re-exposure of immunocompetent Pts is not recommended; TBCMD will review on case-by-case basis if questions[23].
  -

6. MANAGING A COURSE OF TREATMENT FOR LTBI

- *See Table 8* for check lists for TB nurse and for TBCMD for LTBI treatment
- **Medication orders**
  - TBCMD will write prescription using Medication Form A or Form B (latter if 3-HP regimen)
    - If changes in dosing for children are anticipated based on weight gain, TBCMD will indicate weight for new orders on Med Form
  - TBCMD will specify duration of treatment to on Progress Notes and/or on Med Order form
  - TBCMD or pharmacy will check for significant drug interactions using "Facts and Comparisons"
- **Baseline and monitoring blood tests**
  - Baseline laboratory testing including LFTs is not required for all Pts[25]
  - All Pts on treatment for LTBI are clinically monitored for hepatitis
    - Advise patients at treatment initiation to stop medication and contact clinic with the following symptoms which may indicate hepatitis:
    - Loss of appetite for 2 days that is not going away
    - Moderate stomach pain, nausea, or vomiting for 1 day
  - TBCMD will order baseline and follow up LFT for selected Pts prescribed INH *see Table 4*
    - TBCMD will determine schedule of testing on case-by-case basis
    - Any abnormal baseline LFT should have follow up testing

[23] Canadian Tuberculosis Standards 7th edition 2014 p 20
[25] CDC Core Curriculum 2013 p 131

- **Obtain LFTs for Pts on treatment for LTBI who have symptoms suggestive of hepatitis** *see 2.019*

TABLE 4 LFTS DURING TREATMENT OF LTBI WITH INH (ALONE or 3HP OR INH + RIFAMPIN)
TBCMD Consider Checking Routine LFTs in the following situations if treating LTBI with INH
• Chronic liver disease or risk for chronic liver disease as follows – Under medical care for liver disease – Heavy alcohol use within 3 months – Stated history of hepatitis B or C (excludes Hepatitis A) – Stated history of "cirrhosis" – Injection drug use in lifetime • Pregnancy or within 3 months postpartum • Person with Diabetes • Person Living with HIV (PLWH) • Taking other medications known to cause hepatitis • Age above 50 years • Elevated baseline ALT (SGPT)

- **Initial Nursing assessment**
  - Assess Pt's knowledge and beliefs about TB and prevention treatment, offer information *see Table 5*
  - Assess Pt's desire and willingness to complete a course of treatment
  - Identify potential barriers to and ways to enable treatment completion

TABLE 5 PATIENT INFORMATION ABOUT TREATMENT FOR LTBI
What is latent TB infection (LTBI) and why should I take treatment?
• Persons with LTBI have the TB germ (bacteria) in their body, but it is controlled by the immune system • If the TB germ escapes immune system control, TB disease occurs; this may occur within several months of exposure or decades later • It is not possible to predict who will develop TB disease, however estimates are available based on a person's age, place of birth, and co-existing medical conditions[26] • Taking treatment for latent infection significantly reduces the chance that TB disease will develop
What are the risks of treatment and alternatives to treatment?
• Risks of treatment to prevent TB disease are lower than the lifetime risk of TB disease • The alternative to prevention treatment is no treatment unless TB disease occurs • TB disease can potentially spread to family members and friends and can interfere with work and school • TB disease is curable requiring multiple medications for 6-12 months but can cause serious illness
What are the potential side effects and what do I do if they occur?
• See PH-9 Meds for Treatment of TB infection (LTBI)
How do I take the prescribed medication?
• Try to take the medication at approximately same time every day • Take 1 hour before or 2 hours after a large meal, but take the medication with small snack to avoid stomach discomfort EXCEPTION: take 3 HP with meals
What should I do if I miss a dose?
• An occasional missed dose is acceptable, but never double up on the medication to "make up"
Can I drink alcohol while taking this medicine?
• We recommend that you avoid alcohol during treatment; • If you choose to drink, you may increase the chance of liver irritation
Can I take prevention treatment with my other medications?
• We will check for drug interactions with medications that you are taking if you provide the names

[26] "TST in 3D" is an on-line tool to assist health care providers in predicting a person's lifetime risk for TB disease

TABLE 6 NURSING ASSESSMENT PARAMETERS		
FACTORS LEADING TO READINESS FOR TREATMENT		
•Believe that they have personal risk for TB •Want to protect family and friends •Believe that prevention of TB is desirable goal •Believe that tests for TB infection are reliable	•Trust the clinic's recommendations •Pt believes they can complete treatment •No plans to move or travel during treatment	
POTENTIAL BARRIERS TO COMPLETION OF TREATMENT		
•Language •Transportation to and from clinic •Work hours conflict with clinic hours •Child care	• Afraid of side effects • Afraid of drug interactions • Doesn't want to give up alcohol	•Don't trust clinic •Unstable life situation •Afraid of stigma
WAYS TO ENABLE TREATMENT COMPLETION		
• Arrange for Pt-centered refills, e.g. Pt can designate spouse, adult family member or friend to report adverse reactions, # doses left in bottle and pick up refills, arrange telephone assessment in lieu of clinic visits, refills may be mailed •Check-in phone calls - use language line or family member/friends as approved by Pt •Provide clinic appointment reminders as needed •Be available - provide contact phone # to Pt •Issue incentives •Use of alcohol is not a contraindication to treatment, consider baseline LFT if concern over liver •Offer blood pressure or glucose/HgbA1c checks if Pt concerned about drug interactions		

- Missed doses
  - Daily doses
    - Occasional missed doses are acceptable, but all medication prescribed must be taken within the allotted time frame *see Table 7*
    - Advise Pt not to take a double dose to make up for missed dose
  - 3HP
    - Can be given late as long as 72 hours between doses, otherwise skip dose[27]
  - Intermittent INH
    - If 3x/week and misses, skip dose
    - If 2x/week miss, give late as long as at least 72 hours between doses and (no weekend dosing), otherwise skip dose
- Refills
  - Nurse will issue 30- or 60- day supply at nurse's discretion
  - Missed refill appointment
    - Reminder phone call x2; then send letter *see N-34*
    - If Pt does not respond and is no longer able to complete treatment within allotted time, discharge Pt from clinic "lost to follow up" *see Table 9*
  - Pts who complete treatment within the allotted time can be discharged from clinic by the nurse when Pt takes the final DOPT dose or picks up the final refill *see Table 7*

[27] California Department of Public Health TB Control Branch: Fact Sheet: 12-dose INH (INH)/Rifapentine regimen for LTBI treatment March 2017

TABLE 7 COMPLETION OF LTBI THERAPY	
Prescribed course	**Maximum duration of treatment course**
INH x 9 months*	12 months
INH x 6 months	9 months
Rifampin x 4 months	6 months
INH and rifampin x 4 months†	6 months
INH-RPT 12 doses/3 months	11 doses within 16 weeks

*"A 6-month INH regimen provides substantial protection against developing TB disease, but it is less protective than the 9-month regimen"[28]. Pts who are prescribed a 9 month INH regimen who complete 6 months within 9 months can be counted as completing therapy. *Review with TBCMD if questions.*

†Pts who are prescribed a 4 month INH-rifampin regimen who complete 3 months within 6 months can be counted as completing therapy[29]. *Review with TBCMD if questions.*

TABLE 8 NURSE/TBCMD CHECKLISTS FOR TREATMENT LTBI	
STARTING TREATMENT	
NURSE	
☐	Verify that (+) TST or QFT documented
☐	Verify (-) CXR documented: if case contact, CXR within past **2 months**, otherwise **6 months**
☐	Treatment Agreement signed: TB-17 for SAT, *or* TB-21 for DOPT or TB-22 for 3HP
☐	Prepare Treatment Flow Sheet: TB-17 for SAT or TB-13 for DOPT or TB-22 for 3HP
☐	PHI signed as needed for record release to and from PCP
☐	Complete TB-3 Medical History form: weight, list all current medications by name, identify allergies
☐	Share information about treatment of LTBI; answer questions *see Table 5*
☐	Assess readiness for treatment, address barriers to treatment *see Table 6*
☐	TBCMD consult: classification and prescription
☐	Arrange for LFT if ordered by TBCMD
☐	Share Information about medication prescribed and refills *see PH-9*
☐	If young child, give instruction for administration of medication *see SD-17*
☐	Give instructions for refills, what to do if side effects, missed doses
☐	Give initial medication from TBB pharmacy to Pt
☐	Document actions in Medical Record: Progress notes on TB-17 (SAT), TB-13 (DOPT), TB-21 (3HP) or
☐	Document visit in Client Tracking DB>"N visits" screen
TBCMD	
☐	Classify Pt *see 2.009 DOH TB Classification system*
☐	Complete TB-8 Radiology Report
☐	Review potential drug interactions
☐	Determine best treatment regimen
☐	Write prescription (Med Order form A or B); for children include weight for dose increase
☐	PCP letter as indicated *see TBCMD--09*
☐	Write consult note in Progress Notes, order lab work as needed

[28] CDC Core Curriculum 2015 p 119

[29] Canadian Tuberculosis Standards 7th edition p 12

TABLE 8 NURSE/TBCMD CHECKLISTS FOR TREATMENT LTBI (continued)
REFILLS/ ASSESSMENT
NURSE
☐ Review for adverse drug reactions and weigh monthly
☐ Optional: refill appointment reminder call
☐ Pill check (SAT)
☐ Blood work if ordered by TBCMD
☐ Issue refill, schedule next refill as needed
☐ Document actions: TB-17 or TB-23 (TB-04 if DOPT)
☐ Document visit in DB: "N visits" screen
FINAL REFILL
NURSE
☐ Give completion card 5M 77
☐ Document actions: TB-17 or TB-23 (TB-13 if DOPT)
☐ Complete and send TBN-04 PCP LTBI treatment outcome if TBCMD-09 PCP Letter Initiation sent or if Pt requests
☐ Document discharge in DB Change classification from 4A to 4B as needed *see Table 9*

MANAGING ADVERSE DRUG REACTIONS

- *See 2.019* LTBI TX -Nurse Assessment and Management of Adverse Drug Reactions
- *See SD-29* Managing Side Effects of Antimicrobial Agents
- **Hepatitis**[30]
  - About 10% - 20% of persons taking INH will have mild, asymptomatic elevation of liver enzymes
  - If any of the liver enzymes exceed **three times the normal limit with symptoms present** or **five times the upper limit of normal in an asymptomatic individual**, discontinue INH
  - For liver enzyme elevations less than three times the upper limit of normal in symptomatic patients, close clinical and laboratory monitoring should be instituted if treatment is to be continued[31]
- If Pt experiences potentially serious or unacceptable side effects, TBCMD will work with Pt and nurse to consider alternate regimen or discontinuation of treatment

8. **DISCHARGE FROM CLINIC**
   - TB nurse will discharge the Pt from clinic when Pt discontinues treatment for one of the following discharge reasons[32]
     - TBCMD order for discharge not required unless specified below
     - Record the discharge reason in the Medical Record and the Client Tracking Data Base *see Table 9*
   - **Completed full course of treatment** - Pt was issued final refill within allotted time *see Table 7*
     - **NOTE:** When discharging **4A Pts** who are issued the final refill, the TB Nurse (PHN or LPN) is authorized to change the TB classification
   - **Discharge with incomplete treatment**
     - **Adverse Effect of Medicine**
       - Pt stops treatment because of an adverse effect (including drug-drug or drug-food interactions) **and** TBCMD documents the problem and determines that the medicine should be discontinued **and** no treatment alternatives are available; TBCMD will order discharge

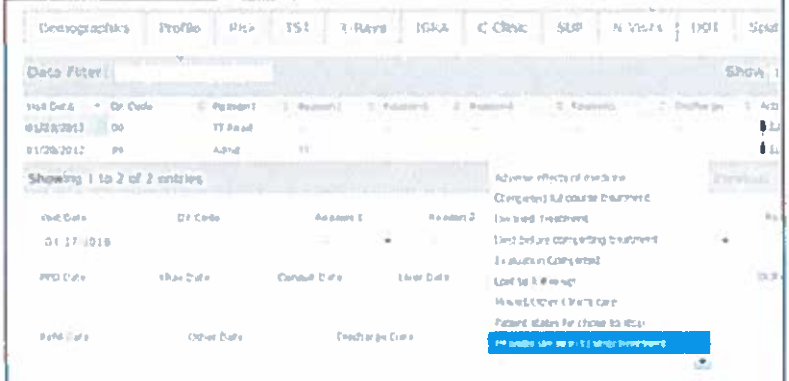
[30] Saukkonen, JJ et al. (2006). "An official ATS statement hepatotoxicity of antituberculosis therapy" Am J Respir Crit Care Med 174 (8):935-952

[31] CDC Core Curriculum p 131-132

[32] Much of the text is taken from the ARPE training manual and users guide p 23-24 https://www.cdc.gov/tb/publications/pdf/arpes_manual.pdf

- NOTE: If a Pt stops because of an adverse effect, but a provider has not recommended the discontinuation, then the reason for stopping treatment should be counted as **patient states chose to stop**; note that alternatives to the original treatment for LTBI can be offered

- **Died before completing treatment**
- **Lost to follow up**
  - Pt whose treatment status at the end of the planned treatment period is incomplete or indeterminate because the health department cannot locate him or her for determining a more specific outcome
  - NOTE: *see Missed refill appointment* for nurse response to missed refill
- **Moved/other clinic's care**
  - Pts who do not complete treatment because they have moved or migrated from the jurisdiction of the local health department should be counted under this category when follow up information is unavailable;
  - NOTE: if the health department receives specific follow up from a receiving jurisdiction, e.g. completed treatment or Lost to Follow-up, then the outcome should be counted accordingly
- **Patient stated chose to stop**
  - Pt decides to stop taking the medicine before they have finished, and a healthcare provider has not determined that the medicine should be discontinued for a medical reason.
  - TBCMD should review these situations before discharge to determine if alternate treatment is acceptable to Pt
  - Examples include trying to get pregnant, busy schedule, can't come to clinic, want to drink alcohol, side effects of medicine but provider did not order discontinuation
- **Provider decision to stop treatment**
  - TBCMD orders discontinuation of treatment because of concerns about the benefits, the safety, or the practicality of treatment, e.g.
    - Pt has such erratic attendance at the clinic that the adequacy and the safety of the treatment cannot be monitored
    - A Pt is found to have cancer and starts intensive chemotherapy, and this makes him very sick; TBCMD decides to postpone treatment of LTBI indefinitely until the more urgent medical issues are settled
    - A Pt becomes pregnant during treatment; the Pt and the TBCMD agree to postpone treatment until after the birth of the baby (although this is not quite in keeping with treatment guidelines);
      - Discharge can be postponed if Pt agrees to return 3 months post-partum to re-start treatment
      - Otherwise discharge Pt. and outcome is **Provider Decision**
  - NOTE: if the Provider decision to stop treatment is brought about by an actual **adverse effect**, then the outcome should be counted under that category instead

TABLE 9 DOCUMENTING DISCHARGE CATEGORIES FOR LTBI TREATMENT[33]	
1. Medical Record TB-17, TB-23	
Treatment Outcome 1. Date LTBI Treatment Started: ____/____/____ 2. Date LTBI Treatment Stopped: ____/____/____ 3. Reason LTBI Treatment Stopped (check only one): ☐ Completed full course of treatment ☐ Adverse effects of medicine ☐ Died before completing treatment ☐ Lost to follow-up or no response ☐ Moved or under care of another clinic ☐ Patient stated chose to stop ☐ Provider decision to stop treatment Staff Signature Date	Treatment outcome section of TB-17 and TB-23 "Date treatment stopped" is anticipated last dose For DOPT, write treatment outcome in Progress NOTES See Section 8 for descriptions of categories
TB Classification circle 2A 2B 2C 2D 4A* *☐Discharge as 4B	If 4A Pt is issued final refill within allotted time, ☑ discharge as 4B on TB-17 or TB-23
2. Client Tracking Data Base	
	Drop down menu on Client Tracking Data Base for "Discharge Reason"
	If 4A Pt is issued final refill within allotted time, change classification as indicated in "N-Visits"

[33] Much of the text is taken from the ARPE training manual and users guide https://www.cdc.gov/tb/publications/pdf/arpes_manual.pdf