

Tuberculosis Screening & Follow-Up

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1.0 Scope of Guideline

This guideline provides tuberculosis (TB) screening and follow-up recommendations and procedures for incident (new to dialysis) adult hemodialysis patients.

The guideline is applicable to in-centre units as new hemodialysis patients are usually started in-centre.

Refer to Appendix 1 for an overview of the TB Screening & Follow-Up Workflow.

2.0 Summary of the Literature & Internet

Tuberculosis (TB) is a disease caused by the bacteria *Mycobacterium tuberculosis* that is spread from person to person through droplets in the air. TB usually affects the lungs, but it can also affect other parts of the body, such as lymph nodes, the brain, kidneys, or the spine.

M. tuberculosis can exist in an active or latent state in the human body:

1. Active TB, also called TB disease, is usually symptomatic and often transmissible. With active TB, tests for TB bacteria are usually positive and radiologic tests may be abnormal.
2. Latent TB infection (LTBI), also called TB infection, is the presence of latent or dormant TB bacteria in the body but no evidence of active TB. This means that the person does not have TB symptoms, there is no evidence of radiographic changes consistent with active TB and microbiologic tests are negative. LTBI is not infectious; however, if left untreated, healthy persons diagnosed with LTBI have a 5-10% lifetime risk of progressing to active TB. This percentage increases significantly when additional risk factors exist, such as end-stage kidney disease, with cited relative risks ranging from 7 - 50 times the background incidence (Canadian TB Standards, 7th Edition, 2014).

This guideline provides recommendations aimed at reducing the incidence of active TB in the chronic kidney disease (CKD) population in BC through incident screening and identification and treatment of dialysis patients with LTBI. Treatment of patients with LTBI will reduce the number of active TB cases in the dialysis population, avoiding time and labour-intensive contact follow-up. Fewer active cases will, in turn, reduce transmission of TB within the larger CKD population.

The TB screening program recommended for dialysis patients in this guideline includes 3 components:

1. TB screening (risk assessment) questionnaire
2. Chest radiography (x-ray)
3. Interferon Gamma Release Assays (IGRA)
 - IGRAs are immunological tests that are (1) not influenced by prior BCG vaccine or exposure to most nontuberculous mycobacteria; and (2) are more robust than Tuberculin Skin Test (TST) in their performance in immunocompromised patients (including those on dialysis) (BCCDC, 2019).
 - The traditional tuberculin skin test (TST) has a high false negative rate (because of a high prevalence of anergy in dialysis patients). The IGRA is reported to be a more sensitive test than the TST in the dialysis population, while offering a comparable level of specificity. (Ferguson, 2014). Further, compared to the TST, the IGRA was associated more strongly with risk factors for LTBI in end-stage kidney disease. (Rogerson, 2013).
 - The sensitivity and specificity of testing varies depending upon the population being tested (BCCDC, 2019).
 - There are two types of IGRA tests available in BC: (1) QuantiFERON®- TB Gold Plus [QFT – Plus] (Enzyme-linked Immunosorbent Assay (ELISA) on whole blood); and (2) T-SPOT®

(Enzyme-linked Immunospot Assay on peripheral blood mononuclear cells). These tests appear to have similar sensitivity and specificity; however, QFT-Plus is easier to use and less expensive. As a result, QFT-Plus is used more often in TB screening of dialysis patients in BC.

3.0 Recommendations

Recommendation #1: Screen the following patients for TB within one month of their first chronic hemodialysis run in BC:

1. All patients who start chronic dialysis (see recommendation #2 for exception)
2. Chronic dialysis patients who move to BC from another province/country

Recommendation #2: Do not rescreen patients previously screened using the BCCDC/BCR screening process (questionnaire, IGRA and chest x-ray) (see recommendation #3 for exception). This includes patients changing treatment types (e.g., PD to HD, transplant to HD, KCC to PD) regardless of the length of time since the initial screening (refer to [Procedure](#) section for ways to identify if previous screening was done). The BCCDC/BCR screening process started in 2016.

For patients with a previous documented IGRA test (anytime in the past) but not as part of the 3-component protocol outlined in this guideline:

- Submit the TB screening questionnaire and chest x-ray as per the 3-component protocol.
- Do not repeat the IGRA. Enter the date the IGRA was completed, and the TB Physician will advise if a more recent IGRA is required.

In general, repeat, or serial IGRA testing is not recommended. In certain circumstances, it may be appropriate - most commonly following a known TB exposure. If unclear for a specific case, contact the Nurse Consultants in TB Services (phone: BCCDC, 604.707.5678; Island Health, 250.519.1510).

Recommendation #3: For patients who received hemodialysis while travelling in a country where TB is endemic:

1. If dialysis **was** for **less than 3 months**, it is not necessary to rescreen for TB. Please be aware that the patient is at higher risk for TB and watch for symptoms.
2. If dialysis was for **longer than 3 months** while travelling in a country where TB is endemic (rate higher than 50/100,000 population):
 - If the baseline IGRA was **negative**, it is recommended that the nephrologist order an IGRA test. If the IGRA result is reactive/positive, refer patient to BCCDC via the usual TB screening process in PROMIS, including completion of the TB screening questionnaire and arranging a chest x-ray.
 - If the baseline IGRA was **positive**:
 - Do not repeat IGRA.
 - If previously treated for latent TB, nothing more is required.

- If not previously treated for latent TB, complete TB screening questionnaire in PROMIS, arrange chest x-ray and refer to BCCDC via PROMIS. Prophylactic treatment may be rediscussed at this stage.

To identify whether TB is endemic:

- Go to the [World Health Organization](#) website (WHO, Data, TB data, TB country, regional and global profiles)
- Go to the green bar at the top of the page and select the country
- Review the “Total TB incidence” rate (first line). If greater than 50/100,000 population, IGRA is recommended.

Recommendation #4: Utilize the BCCDC/BCR 3-component protocol to screen for TB:

1. TB screening (risk assessment) questionnaire.
2. IGRA blood test: QFT - Plus.
3. Chest x-ray within the past 6 months.

The TB Screening Tracking Report in PROMIS shows the TB Assessment Date (completion of TB screening questionnaire), chest X-Ray order date, TB IGRA order date and the date that BCCDC was alerted (BCCDC is alerted automatically by PROMIS when the three components are completed).

TB screening (risk assessment) questionnaire (see Appendix 2 for example)

This questionnaire is available as a fillable form in PROMIS. Print the questionnaire from PROMIS (demographics will auto populate), discuss the questions with the patient and enter the responses into PROMIS. BC Centre for Disease Control (BCCDC) will have access to the completed questionnaire, along with the results of the IGRA test and chest x-ray, in PROMIS for analysis.

IGRA testing (see Appendix 3 for example of IGRA lab requisition)

The IGRA lab requisition is available in PROMIS (demographics will auto populate). Print the requisition from PROMIS and place with the blood sample prior to sending to the laboratory. BE SURE TO USE THE IGRA LAB REQUISITION IN PROMIS and not the standard lab requisition.

IGRA blood samples may be drawn in any hospital that has been designated (trained and set up) as an *IGRA collection site* by the BCCDC Provincial Health Laboratory.¹ See www.bccdc.ca/resource-gallery/Documents/Educational%20Materials/TB/IGRASites.pdf (note the restricted days/hours for IGRA blood collection). Pre-analytical processing of samples is performed in any hospital that has been designated (trained and set up) as an *IGRA processing site*. Accurate results rely on specific collection methods and care of samples after the blood draw.

- Samples are drawn from the HD fistula/graft or central venous catheter by the RN using the established protocol (Appendix 5).
- Samples are sent to the laboratory in the hospital in which the HD unit resides (IGRA collection site) as soon as possible after drawing.

¹ All hospitals with in-centre HD units are IGRA collection sites.

- If the receiving laboratory is a designated *IGRA processing site*:
 - Samples are incubated for 16-24 hours.
 - Samples are centrifuged and the plasma portion pipetted off into new vials.
 - Plasma samples are transported to the BCCDC Public Health Laboratory for analysis.
- If the receiving laboratory is *NOT* a designated *IGRA processing site*:
 - The receiving laboratory packages the samples (insulated so that the samples are maintained at room temperature).
 - The receiving laboratory transports the samples to a designated IGRA processing site within the HA for processing (Note: samples must be incubated within 16 hours of collection at the designated IGRA processing site).

BCCDC will have access to the results of the IGRA test, along with the completed questionnaire and chest x-ray report, in PROMIS for analysis. The results of the IGRA tests are usually available within 1 week of the sample being drawn.

Chest x-ray (see Appendix 4 for example of chest x-ray requisition)

The chest x-ray requisition is available in PROMIS (demographics will auto populate). Print the requisition from PROMIS and give to the patient. BE SURE TO USE THE CHEST X-RAY REQUISITION IN PROMIS and not the standard radiology requisition.

The patient may have his/her chest x-ray at any hospital medical imaging department. Once the report is available, a copy will be sent by the medical imaging department to the HD unit and to the BCCDC. BCCDC will manually upload the report into PROMIS.

If the patient has had a chest x-ray within the past 6 months, a repeat chest-ray is not required. Enter the date the x-ray was completed into PROMIS. BCCDC will manually upload the x-ray report into PROMIS. If this report/image is inconclusive, BCCDC will advise the HD unit to provide the patient with a chest x-ray requisition specific for ruling out TB.

BCCDC will have access in PROMIS to all 3 components of TB screening to complete their analysis - the completed TB screening questionnaire, IGRA test results and the chest x-ray report.

Recommendation #5: If an IGRA result is “indeterminant” or “unsatisfactory,” repeat once (if available at your site, consider T-spot instead of a second QFT). If the second result comes back indeterminant or unsatisfactory, do not repeat. The TB physician will review the file and issue a report based on the information available.

Recommendation #6: Once all 3 components in recommendation #4 have been completed, PROMIS will automatically alert BCCDC.

Once BCCDC receives the "Alert" from the renal unit, they will check PROMIS for the completed TB screening questionnaire, the IGRA blood test result and the chest x-ray report. If any of these components are missing one month after the "Alert" was sent, BCCDC will notify the patient's unit. The unit will be responsible for follow-up with the patient. If components are still missing after

another 2 months, the incomplete information will be sent to the TB screening physician who will issue a report indicating incomplete results.

If the patient wishes to complete the screening in the future (e.g., when starting the transplant process), the process/referral will need to be started again at that time.

Recommendation #7: HA HD programs and local laboratories are responsible for establishing processes to educate HD nurses on the collection and handling of blood samples from fistulas/grafts/central venous catheters as per Appendix 5.

Recommendation #8: After analysis of the results, BCCDC TB Services will issue a report/letter, including recommendations.

BCCDC TB Services will manually upload the report/letter, including recommendations, into PROMIS. Reports/letters will be available in PROMIS within 1 month of the three components being received by the BCCDC. To review the report/letter in PROMIS, search for the patient, go to "Documents," then filter by "TB Services Recommendations."

Distribution of the reports/letters and follow-up of results will depend upon the outcome of the testing. See Appendix 6 for an overview of report/letter distribution and follow-up for each type of result. Copies of the reports/letters for different result types are available in Appendix 7.

**For Island Health, BCCDC will fax copies of the TB screening questionnaire, IGRA blood test results and the chest x-ray report to the Island Health TB Clinic (BCCDC will also upload a copy of the chest x-ray report into PROMIS). The Island Health TB Clinic will analyze the results and issue a report/letter, including recommendations. The Island Health TB Clinic will alert BCCDC TB Services of the availability of a report in Panorama. BCCDC TB Services will upload the report/letter into PROMIS. Island Health TB Clinic will follow-up on the results with the patient/appropriate care providers.*

Recommendation #9: Implement appropriate TB precautions within the dialysis unit as per follow-up protocols.

LBTI is not infectious, therefore, there are no specific infection control procedures required for patients diagnosed with LTBI. If active TB is identified, local facility infection control procedures should be implemented and reported to BCCDC.

4.0 Procedure

1. Designate a person(s) responsible for maintaining TB screening processes and to ensure the process is completed for every new HD patient (e.g., Patient Care Coordinator).

2. Utilize the TB Screening Tracking Report in PROMIS to track new chronic HD patients and the status of each component of TB screening:
 - Go to Reports, TB Screening.
 - Enter the dates of interest (based on start date of chronic dialysis), dialysis type and dialysis or primary management centre.
 - Click on Run.

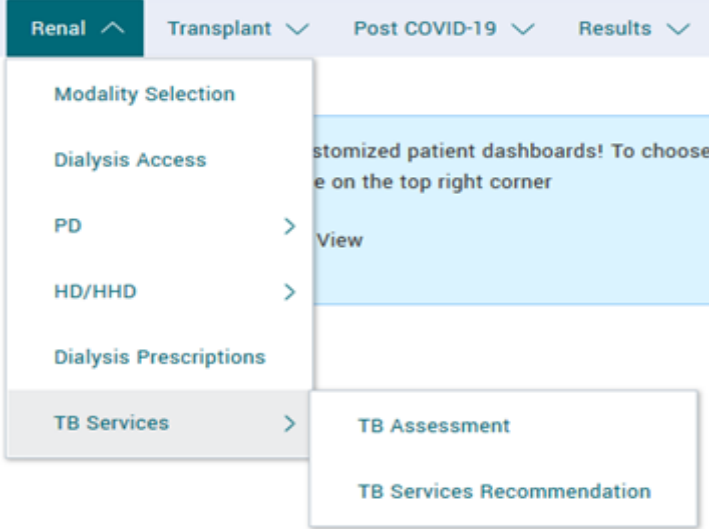

The report will show the TB Assessment Date (completion of questionnaire), chest X-Ray order date, IGRA order date and the date that BCCDC was alerted (BCCDC is alerted automatically by PROMIS when the first three components are completed).


3. Incorporate into the pre-printed orders for new chronic HD patients:
 - a. Complete TB screening questionnaire
 - b. IGRA blood test (QFT-Plus)
 - c. Chest x-ray within the past 6 months
4. Once patient is registered in PROMIS, print the following documents and add to new HD patient package (unless a previous TB screening report is on file):
 - a. Auto-populated TB Screening Questionnaire
 - b. Auto-populated Laboratory Requisition for IGRA (QFT-Plus) blood test (unless a previous IGRA result is on file)
 - c. Auto-populated Chest X-Ray Requisition (unless a chest x-ray was completed within the previous 6 months)

* It is important to use the forms in PROMIS that are auto-populated. DO NOT USE STANDARD LAB REQUISITIONS/CHEST X-RAY FORMS.
5. Obtain blood collection tubes for IGRA testing (hospital laboratory to provide).

Procedure

Component		Action	Responsibility
1	Check for previous IGRA/TB screening report	<p>Check if patient has been previously screened for TB using the BCCDC/BCR screening process (questionnaire, IGRA and chest x-ray). If so, screening does not need to be repeated.</p> <p>To check for previous TB screening:</p> <ul style="list-style-type: none"> • On PROMIS 4, go to Renal > TB Assessment • If the TB Screening Questionnaire Summary is blank, TB screening was not previously completed • If there is a pre-existing TB Screening Questionnaire, click to open • Click on or scroll down to TB Services Completes to see if there has been a TB physician review 	Unit Clerk

Component	Action	Responsibility
Check for previous IGRA/TB screening report cont'd	To view the TB physician narrative report: <ul style="list-style-type: none"> On PROMIS 4, go to Documents, filter by TB Services Recommendation TB Physician/Nurse Practitioner narratives are also automatically uploaded to CareConnect under Documents 	
2 TB screening questionnaire See Appendix 2	After patient is registered in PROMIS, prepare questionnaire: <ul style="list-style-type: none"> Search for patient. Under Renal menu, select TB Services. Under TB Assessment tab, select Add: <ul style="list-style-type: none"> Enter assessment date. Check off the Population at Risk checkbox. Select Renal TB Screening as the Reason for Screening. Under Risk Factors, check Chronic Renal Disease/Dialysis. Select Save. 	Unit Clerk
	Print questionnaire from PROMIS (Appendix 2): <ul style="list-style-type: none"> Select Reports menu (same line as Renal menu).  <ul style="list-style-type: none"> Select arrow next to TB Screening to view list of reports. Select TB Screening Questionnaire. Select Assessment Date entered above. Select Run Report. Print TB Screening Questionnaire and place in patient's record. 	Unit Clerk

Component	Action	Responsibility
TB screening questionnaire cont'd	 <p>Fill out Questionnaire with patient.</p> <p>Enter completed Questionnaire in PROMIS:</p> <ul style="list-style-type: none"> • Search for patient. • Under Renal menu, select TB Services. • Under TB Assessment tab, select record with the corresponding Assessment Date. • Select pencil icon next to Nurse Completes to edit the record. • Enter information (from completed Questionnaire). • Select Save. <p>Discard hard copy of Questionnaire once entered into PROMIS.</p>	RN Unit Clerk
3 IGRA (QFT-Plus) blood test See Appendix 3	<p>Check Care Connect/PROMIS for previous IGRA test. If none, print lab requisition from PROMIS (Appendix 3).</p> <ul style="list-style-type: none"> • Search for patient. • Select Reports menu (on same row as the Renal menu). • Select the arrow next to TB Screening to view list of reports. • Select IGRA-QFT Requisition. Note: Primary nephrologist will show as the ordering physician – do not change. • Select Run Report. • Print requisition and provide to RN. 	Unit Clerk
	<p>Collect blood sample (check with local laboratory as to limitations on days that IGRA samples can be received).</p> <ul style="list-style-type: none"> • Draw blood as per procedure in Appendix 5. • Attach label to sample (usual patient label) & send sample & requisition to hospital laboratory. 	RN or Lab

Component		Action	Responsibility
	IGRA (QFT-Plus) blood test cont'd	<p>Document collection of blood test or date previous IGRA test was completed in PROMIS:</p> <ul style="list-style-type: none"> • Search for patient. • Under Renal menu, select TB Services. • Under TB Assessment tab, select record with the corresponding Assessment Date. • Select pencil icon next to Nurse Completes to edit record. • Under IGRA Test section, check IGRA Test QFT checkbox and enter IGRA Order Date. • Click Save. 	Unit Clerk
3	Chest x-ray See Appendix 4	<p>Check Care Connect for chest x-ray performed in past 6 months. If none, print requisition from PROMIS (Appendix 4).</p> <ul style="list-style-type: none"> • Search for patient. • Select Reports menu (same row as Renal menu). • Select arrow next to TB Screening to view list of reports. • Select Chest X-Ray Requisition. Note: Primary nephrologist will show as ordering physician – do not change. • Under Management Centre, select HD unit. • Under Unit, select HD Unit. • Select Run Report. • Print requisition & give to patient. • Instruct patient to have chest x-ray done at a <u>hospital</u> medical imaging department within the week. 	Unit Clerk
		<p>Document that patient was provided the requisition or had a chest x-ray completed within the past 6 months in PROMIS:</p> <ul style="list-style-type: none"> • Search for patient. • Under Renal menu, select TB Services. • Under TB Assessment tab, select record with the corresponding Assessment Date. • Select pencil icon next to Nurse Completes to edit record. • Under Chest X-Ray section, enter Order Date. • Click Save. <p>BCCDC will review results and upload into PROMIS.</p>	Unit Clerk
5	BCCDC will be notified	Once all 3 components have been completed, PROMIS will automatically alert BCCDC.	PROMIS

BCCDC contact for questions: TB Services, phone: 604-707-5678 or tb nurseconsultants@bccdc.ca. For Island Health, call 250.519.1510.

5.0 References

BC Centre for Disease Control (BCCDC). Interferon gamma release assay testing guideline for latent tuberculosis infection: Physician guidelines. www.bccdc.ca/resource-gallery/Documents/Communicable-Disease-Manual/Chapter%204%20-%20TB/TB_manual_IGRA_guidelines.pdf (July 15, 2021). Accessed Nov 1, 2022.

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Rogerson, TE et. al. (2013). Tests for latent tuberculosis in people with ESRD: A systematic review. *Am J Kidney Dis*, 61(1): 33-43. <http://www.ncbi.nlm.nih.gov/pubmed/23068425>. Accessed Nov 1, 2022.

6.0 Sponsors

Original version (2015) developed by:

- A working group of representative groups of renal clinicians and directors/managers, BC laboratories, BCCDC TB Services, Island TB Clinic and BC Renal (BCR)

Original version (2015) approved by:

- BCR Hemodialysis Committee
- BCR Medical Advisory Committee
- Provincial Committee for Implementation of TB Screening for Dialysis Patients (BCR/BCCDC, BC Public Health Microbiology and Reference Lab)

Update in 2019 reviewed by:

- Representatives from Zoonotic Diseases & Emerging Pathogens Laboratory, BCCDC Public Health Laboratory (Team Lead & Technical Coordinator)
- BC Renal Hemodialysis Committee (Sept 11, 2019 – discussed but not reviewed)

Update in 2022:

- Updated following the development of a guideline for TB screening for Kidney Care Clinic (KCC) patients referred for transplant. This was completed in collaboration with representatives from BCCDC, the PROMIS Team and BC Kidney Care Committee.
- BC Renal Hemodialysis Committee (Nov 16, 2022)

Update in 2024:

- Updated following a review of various details of testing. This was summarized in a memo sent out in January 2024.
- BC Renal Hemodialysis Committee (January 2024)

7.0 Appendices

Appendix 1: BC TB Screening Workflow for Renal Patients

Appendix 2: TB Screening Questionnaire (printed from PROMIS)

Appendix 3: IGRA Lab Requisition (printed from PROMIS)

Appendix 4: Chest X-Ray Requisition (printed from PROMIS)

Appendix 5: QuantiFERON®-TB Gold Plus [QFT-Plus] Test Blood Collection and Tube Handling Technique

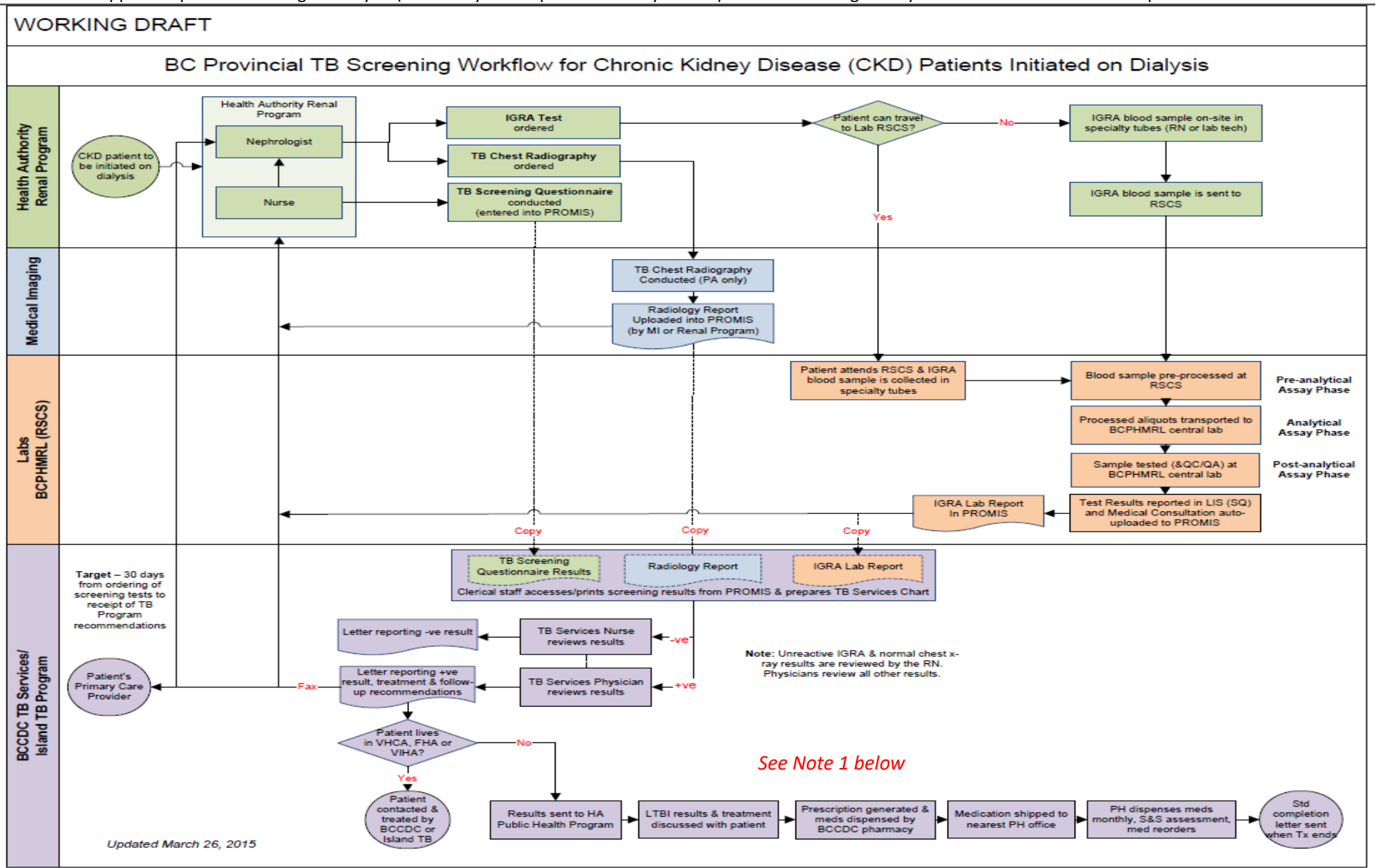
Appendix 6: Distribution of Reports/Letters & Follow-up of Results

Appendix 7: Samples of Follow-up Reports/Letters for Different Results:

- Letter 1: Non-Reactive IGRA Results
- Letter 2: Reactive IGRA Results (Latent TB infection)

Appendix 1: BC TB Screening Workflow for Renal Patients

This workflow applies to patients starting on dialysis (hemodialysis and peritoneal dialysis and patients attending Kidney Care Clinics referred for transplant.



Note 1: For specifics on report distribution and follow-up result type, refer to appendices 6 and 7.

Appendix 2: TB Screening Questionnaire in PROMIS



1. Please complete all sections highlighted in yellow (unless pre-populated with correct information).
2. Reason for screening: Provincial Renal TB Screening.

BC Centre for Disease Control An agency of the Provincial Health Services Authority		Provincial Tuberculosis Services		TB SCREENING FORM Provincial Form adapted for Renal Patients, Sept 2022	
BILLING INSTRUCTIONS: <input type="checkbox"/> PAYMENT RECEIVED <input type="checkbox"/> BILL CLIENT <input type="checkbox"/> BILL MSP <input checked="" type="checkbox"/> BILL TO TB SERVICES MSP BILLING # 99996					
TODAY'S DATE (YYYY/MM/DD) 18-OCT-2022		PERSONAL HEALTH NUMBER (PHN) 8668151283		TB SERVICES USE ONLY ID NUMBER 4	
PART 1: CLIENT COMPLETES (use ink and print clearly)					
LAST NAME BELL		GIVEN NAME(S) TEST		MAIDEN NAME (IF APPLICABLE)	
FULL ADDRESS 123 MAIN			CITY VANCOUVER		PROVINCE BC
DATE OF BIRTH (DD/M/YYYY) 05 MAR 1981			GENDER <input type="checkbox"/> M <input checked="" type="checkbox"/> F		POSTAL CODE V6Z1Y6
ETHNIC ORIGIN		FIRST NATIONS STATUS <input type="checkbox"/> STATUS INDIAN <input type="checkbox"/> NON-STATUS INDIAN		FIRST NATIONS INITIUMETIS <input type="checkbox"/> ON RESERVE <input type="checkbox"/> OFF RESERVE	
COUNTRY OR CANADIAN PROVINCE OF BIRTH BRITISH COLUMBIA		DATE ENTERED CANADA (YYYY/MM/DD) / /		PRIMARY PHONE NUMBER (778)000-0000	
NAME OF REFERRING PHYSICIAN(S)/HEALTH CARE PROVIDER(HCP) & SPECIALTY				ALTERNATE PHONE NUMBER	
NAME OF FAMILY GP SAUNDERS, MARYAM				PHONE NUMBER OF REFERRING HCP	
NAME OF FAMILY GP				PHONE NUMBER OF FAMILY GP (111)333-4444	
PART 2: HEALTH CARE PROVIDER COMPLETES					
REASON FOR SCREENING (REFER TO CODES) Renal TB Screening		MEDICATION ALLERGIES <input checked="" type="checkbox"/> NONE		RECENT LIVE VACCINE ADMINISTRATION? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NONE	
IF CONTACT, NAME OF TB CASE OR ID#		LAST DATE OF CONTACT (YYYY/MM/DD) / /		HISTORIC EXPOSURE? IF YES, LIST DETAILS (NAME, DATE (DD)) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
RISK FACTORS <input type="checkbox"/> NONE					
<input checked="" type="checkbox"/> HIV <input type="checkbox"/> TRANSPLANT (SPECIFY)		<input checked="" type="checkbox"/> CHRONIC RENAL DISEASE/DIALYSIS		<input checked="" type="checkbox"/> CANCER (SPECIFY) test	
<input type="checkbox"/> TRAVEL TO HIGH PREVALENCE COUNTRY (SPECIFY WHERE & DATES)		<input type="checkbox"/> SUBSTANCE USE		<input checked="" type="checkbox"/> DIABETES	
<input type="checkbox"/> IMMUNE SUPPRESSING MEDS (SPECIFY NAME, DOSE & DURATION)				<input type="checkbox"/> SETTING	
				<input type="checkbox"/> OTHER (SPECIFY)	
SYMPTOMS					
<input type="checkbox"/> NONE <input checked="" type="checkbox"/> COUGH <input checked="" type="checkbox"/> PRODUCTIVE COUGH		<input type="checkbox"/> FATIGUE <input checked="" type="checkbox"/> NIGHT SWEATS		<input type="checkbox"/> FEVER <input type="checkbox"/> WEIGHT LOSS <input type="checkbox"/> CHEST PAIN	
<input checked="" type="checkbox"/> BLOOD IN SPUTUM <input type="checkbox"/> LYMPHADENOPATHY		<input checked="" type="checkbox"/> SPUTUM PRODUCTION		<input checked="" type="checkbox"/> OTHER test	
HEPATITIS HISTORY? <input type="checkbox"/> NONE <input checked="" type="checkbox"/> HEP B <input checked="" type="checkbox"/> HEP C <input type="checkbox"/> UNKNOWN		PREVIOUS BOG? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> UNKNOWN		IF YES, DATE (YYYY/MM/DD)	
HAS CLIENT EVER HAD TB? <input type="checkbox"/> YES ACTIVE <input type="checkbox"/> YES LATENT <input checked="" type="checkbox"/> NO		PREVENTATIVE TREATMENT? <input type="checkbox"/> YES, DATE <input checked="" type="checkbox"/> NO		RESULT OF PREVIOUS TST <input checked="" type="checkbox"/> UNKNOWN <input type="checkbox"/> NEGATIVE <input type="checkbox"/> POSITIVE	
DATE (YYYY/MM/DD)		DATE (YYYY/MM/DD)		LOCATION	
INITIAL TST GIVEN BY (ENTER CODE OF NURSE/PHYSICIAN, HOSPITAL, HEALTH CENTRE AND PRINT PROVIDER NAME) test		DID NOT TEST DATE GIVEN (YYYY/MM/DD) 18 OCT 2022		DATE READ (YYYY/MM/DD) 18 OCT 2022	
LOT #		SIZE OF INDURATION 45		MM	
FOLLOW-UP RECOMMENDATIONS <input checked="" type="checkbox"/> NO FURTHER TESTING <input type="checkbox"/> REPEAT TST IN _____ WEEKS		<input type="checkbox"/> SPUTUM FOR AFB <input type="checkbox"/> IGRA		<input checked="" type="checkbox"/> CXR, TYPE <input checked="" type="checkbox"/> PA <input checked="" type="checkbox"/> LATERAL <input checked="" type="checkbox"/> DECLINED	
REPEAT TST GIVEN BY (ENTER CODE OF NURSE/PHYSICIAN, HOSPITAL, HEALTH CENTRE AND PRINT PROVIDER NAME) test		DID NOT TEST DATE GIVEN (YYYY/MM/DD) 18 OCT 2022		DATE READ (YYYY/MM/DD) 18 OCT 2022	
LOT #		SIZE OF INDURATION 45		MM	
FOLLOW-UP RECOMMENDATIONS <input checked="" type="checkbox"/> NO FURTHER TESTING <input type="checkbox"/> SPUTUM FOR AFB		<input checked="" type="checkbox"/> CXR, TYPE <input checked="" type="checkbox"/> PA <input checked="" type="checkbox"/> LATERAL <input checked="" type="checkbox"/> DECLINED			
HISTORY OF IGRA TEST? <input checked="" type="checkbox"/> QFT <input type="checkbox"/> T-SPOT <input type="checkbox"/> NO		RESULT OF IGRA? <input type="checkbox"/> NON-REACTIVE <input type="checkbox"/> REACTIVE		DATE (YYYY/MM/DD) 18 OCT 2022	
				LOCATION	
ADDITIONAL COMMENTS:					
PART 3: TB SERVICES COMPLETES - RADIOLOGY RESULTS					
LOCATION OF CXR test DATE OF CXR 18 OCT 2022 CXR ON <input checked="" type="checkbox"/> CARE CONNECT <input checked="" type="checkbox"/> E-FILM <input type="checkbox"/> SECURE DRIVE <input type="checkbox"/> WCMI OR <input type="checkbox"/> REPORT ONLY					
PART 4: TB SERVICES COMPLETES - RECOMMENDATIONS					
<input type="checkbox"/> NO EVIDENCE OF ACTIVE TB		<input type="checkbox"/> REPEAT TST		CLINIC APPOINTMENT	
<input checked="" type="checkbox"/> SEE REPORT		<input type="checkbox"/> IGRA		<input checked="" type="checkbox"/> LTBI OFFER	
<input type="checkbox"/> TB LETTER (SPECIFY) _____				<input type="checkbox"/> OTHER (SPECIFY) _____	
				DATE & SIGNATURE 24 OCT 2022	

The information collected on this form is used by the BC Centre for Disease Control to deliver Provincial TB Services. It is collected under the authority of British Columbia's Public Health Act. Personal information is protected from unauthorized use and disclosure in accordance with the Freedom of Information and Protection of Privacy Act and may be disclosed only as provided by that Act.

Appendix 3: IGRA Lab Requisition in PROMIS

1. Please complete fields highlighted in yellow (unless already pre-populated with correct information).
2. TB IGRA Testing Criteria: Dialysis patient

 <p>BC Centre for Disease Control An agency of the Provincial Health Services Authority</p>	<p>Public Health Laboratory 655 West 12th Avenue, Vancouver, BC V5Z 4R4 www.bccdc.ca/publichealthlab</p>	<p>Zoonotic Diseases & Emerging Pathogens Requisition</p>  <p>LM LABS</p>
FOR BCCDC TB SERVICES USE ONLY		

Section 1 - Patient Information (Two matching unique patient identifiers on sample container and requisition are required for sample processing)

PERSONAL HEALTH NUMBER (or out-of province Health Number and province)	DOB (DD/MM/YYYY) 27/JAN/1953	SEX <input type="checkbox"/> M <input checked="" type="checkbox"/> F <input type="checkbox"/> UNK	LABORATORY USE ONLY
PATIENT SURNAME CHEN	PATIENT FIRST AND MIDDLE NAME MAGDALENE		
ADDRESS 123 MAIN	CITY VANCOUVER	POSTAL CODE V6Z1Y6	
Section 2 - Healthcare Provider Information			DATE RECEIVED OUTBREAK ID SAMPLE REF. NO. DATE COLLECTED (DD/MM/YYYY) TIME COLLECTED (H:MM)
ORDERING PRACTITIONER (Provide MSC#) Name and address of report delivery ADAMS, AGNES(8672), 123 Main, Vancouver, BC, V5G2X6		ADDITIONAL COPIES TO PRACTITIONER/CLINIC: (Name, Address/MSCA/PHSA Client#) (Limit of 3 copies available)	
<input checked="" type="checkbox"/> Approved by Provincial TB Services <input type="checkbox"/> I do not require a copy of the report <input type="checkbox"/> I am a Locum If Locum, include name of Practitioner you are covering for		1. PROMIS 2. BCCDC TB SERVICES 3. DR VICTORIA COOK	

Section 3 - Test(s) Requested

<p>VIRUSES</p> <input type="checkbox"/> Chikungunya Virus Antibody <input type="checkbox"/> Dengue Virus Antibody <input type="checkbox"/> Hanta Virus Antibody for hemorrhagic cases consultation required <input type="checkbox"/> West Nile Virus Antibody <input type="checkbox"/> Zika Virus Antibody and PCR Submit 1 gold top and 1 EDTA blood tube <input type="checkbox"/> Other, specify: _____ Travel / Clinical History Required for Above Tests: (Indicate prenatal status for Zika virus): _____ Signs / Symptoms <input type="checkbox"/> Asymptomatic <input type="checkbox"/> Insect bite: <input type="checkbox"/> Skin rash: Type/Location: _____ <input type="checkbox"/> Neurological <input type="checkbox"/> Other, specify: _____	<p>BACTERIA</p> <input type="checkbox"/> Anti-Streptolysin O (ASO) <input type="checkbox"/> Bartonella henselae <input type="checkbox"/> Antibody <input type="checkbox"/> PCR <input type="checkbox"/> Borrelia burgdorferi (Lyme disease) <input type="checkbox"/> Antibody <input type="checkbox"/> PCR <input type="checkbox"/> Borrelia hermslii Antibody <input type="checkbox"/> Brucella abortus Antibody <input type="checkbox"/> Coxiella burnetii (Q-fever) Antibody <input type="checkbox"/> Diphtheria Antitoxin <input type="checkbox"/> Francisella tularensis Antibody <input type="checkbox"/> Helicobacter pylori Antigen (Foxes) <input type="checkbox"/> Legionella sp. Urine Antigen <input type="checkbox"/> Leptospira spp. <input type="checkbox"/> Antibody <input type="checkbox"/> PCR <input type="checkbox"/> Rickettsia rickettsii Antibody (Rocky Mountain Spotted Fever) <input checked="" type="checkbox"/> TB Interferon Gamma Release Assay* <input checked="" type="checkbox"/> QFT Gold Plus <input type="checkbox"/> T Spot <input type="checkbox"/> Tetanus Antitoxin	<p>PARASITES</p> <input type="checkbox"/> Echinococcus spp. Antibody <input type="checkbox"/> Entamoeba histolytica (Amoebiasis) Antibody <input type="checkbox"/> Schistosoma spp. Antibody <input type="checkbox"/> Strongyloides spp. Antibody Travel History Required for Above Tests: <input type="checkbox"/> Travel within past 12 months, specify: _____ <input type="checkbox"/> Leishmania spp. Antibody <input type="checkbox"/> Toxoplasma gondii Antibody <input type="checkbox"/> Immune status IgG <input type="checkbox"/> Acute infection IgM <input type="checkbox"/> Trichinella spp. Antibody <input type="checkbox"/> Trypanosoma cruzi (American trypanosomiasis) Antibody <input type="checkbox"/> Other, specify: _____
<p>SYPHILIS</p> <input type="checkbox"/> VDRL (CSF sample only) Submit 1 mL CSF in sterile leak-proof tube <input type="checkbox"/> Treponema pallidum Nucleic Acid Testing* Submit exudate, tissue or body fluid <input type="checkbox"/> Darkfield (DF) Microscopy Source of sample: _____ <input type="checkbox"/> Direct Fluorescent Assay (DFA) Microscopy Source of sample: _____ Signs / Symptoms <input type="checkbox"/> Asymptomatic <input type="checkbox"/> Rash <input type="checkbox"/> Other, specify: _____	<p>FUNGI</p> <input type="checkbox"/> Blastomyces dermatidis Antibody <input type="checkbox"/> Coccidioides sp. Antibody <input type="checkbox"/> Cryptococcus neoformans Antigen <input type="checkbox"/> Histoplasma sp. Antibody <input type="checkbox"/> Other, specify: _____ Travel History Required for Above Tests: <input type="checkbox"/> Travel within past 12 months, specify: _____	<p>* TB IGRA TESTING CRITERIA</p> <input type="checkbox"/> 1. TST negative, immunocompromised <input type="checkbox"/> 2. TST positive, BCG positive <input type="checkbox"/> 3. TST positive, indigenous / Foreign born <input checked="" type="checkbox"/> 4. Dialysis patient <input type="checkbox"/> 5. CKD direct transplant <input type="checkbox"/> 6. SOT and L/BMT patient For other available tests and additional information, consult the Public Health Laboratory's eLab Handbook at www.elabhandbook.info/PHSA/Default.aspx

For information on sample collection, please call Zoonotic Diseases & Emerging Pathogens Lab at (604) 707-2628

Form DCZP_100_0002F Version 3 07/2022

Appendix 4: Chest X-Ray Requisition in PROMIS

Please complete fields highlighted in yellow (unless already pre-populated with correct information).

MSP billing number: 99996



Chest X-Ray Requisition

Patient Information

Name: CHEN, MAGDALENE DOB: 27-JAN-1953

PHN: 9870983905 Phone: 250-585-8596

Address: 123 MAIN, VANCOUVER, BC, V6Z1Y6

Date: 02-NOV-2022

Ordering Physician: ADAMS, AGNES - 8672

Vancouver Hospital And H.S.C.

Hemodialysis Unit _____

Additional Copies to: BCCDC TB Services, Dr Victoria Cook

Chest X-Ray Exam Reason

- **Exam Requested: Chest**
 - Posterior anterior (PA) Lateral Other, Specify: _____
- **Exam Reason:**
 - TB Contact
 - TB Screening
 - Rule Out Active TB
 - Symptoms
 - Repeat CXR

<input type="checkbox"/> On Treatment	<input type="checkbox"/> End of Treatment	<input type="checkbox"/> Surveillance
<input type="checkbox"/> Active	<input type="checkbox"/> Active	<input type="checkbox"/> Immigration
<input type="checkbox"/> Latent	<input type="checkbox"/> Latent	<input type="checkbox"/> Other, Specify: _____

Respiratory Precautions Required: YES NO

For Radiology Use Only

BC CENTRE FOR DISEASE CONTROL TUBERCULOSIS SERVICES

655 West 12th Avenue
Vancouver, BC
V5Z 4R4

IF PHN NOT VALID

- Bill Client
- Invoice TB Services



Appendix 5: QuantiFERON®-TB Gold Plus [QFT – Plus] Test Blood Collection

Before collecting the blood, please familiarize yourself with the notes that follow steps 1 - 3.

Step 1: Blood Collection

Before dialysis, collect 1.0 mL blood into each blood collection tube.

- Blood collection tubes should be at room temperature (17 - 25°C) at the time of blood collection.
- As 1 mL tubes draw blood relatively slowly, keep the tube on the needle for 2 - 3 seconds once the tube appears to have completed filling.
- The black mark on the side of the tubes indicates the validated range of 0.8 to 1.2 mL. If the level of blood in any tube is outside of the indicator mark, a new blood sample should be obtained.
- It is important to ensure the needle or angiocath is free of air prior to collecting the samples.

Order of collection:



1. Grey cap (Nil)
2. Green cap (TB1 Antigen)
3. Yellow cap (TB2 Antigen)
4. Purple cap (Mitogen Control)



Step 2: Tube Shaking

Immediately after filling the tubes, shake them ten (10) times, just firmly enough to ensure the entire inner surface of tube is coated with blood.

Overly vigorous shaking may cause gel disruption and could lead to aberrant results.

Step 3: Label Tubes & Send to Local Laboratory

When labelling the tube, do not cover the black mark and the window. Send tubes to the local laboratory at the in-centre unit hospital as soon as possible (tubes must be incubated within 16 hours of collection). Do not refrigerate or freeze the blood samples. The laboratory will incubate, centrifuge, aliquot and ship samples to the BC Public Health Microbiology and Reference Lab, Zoonotic Diseases & Emerging Pathogens Program.

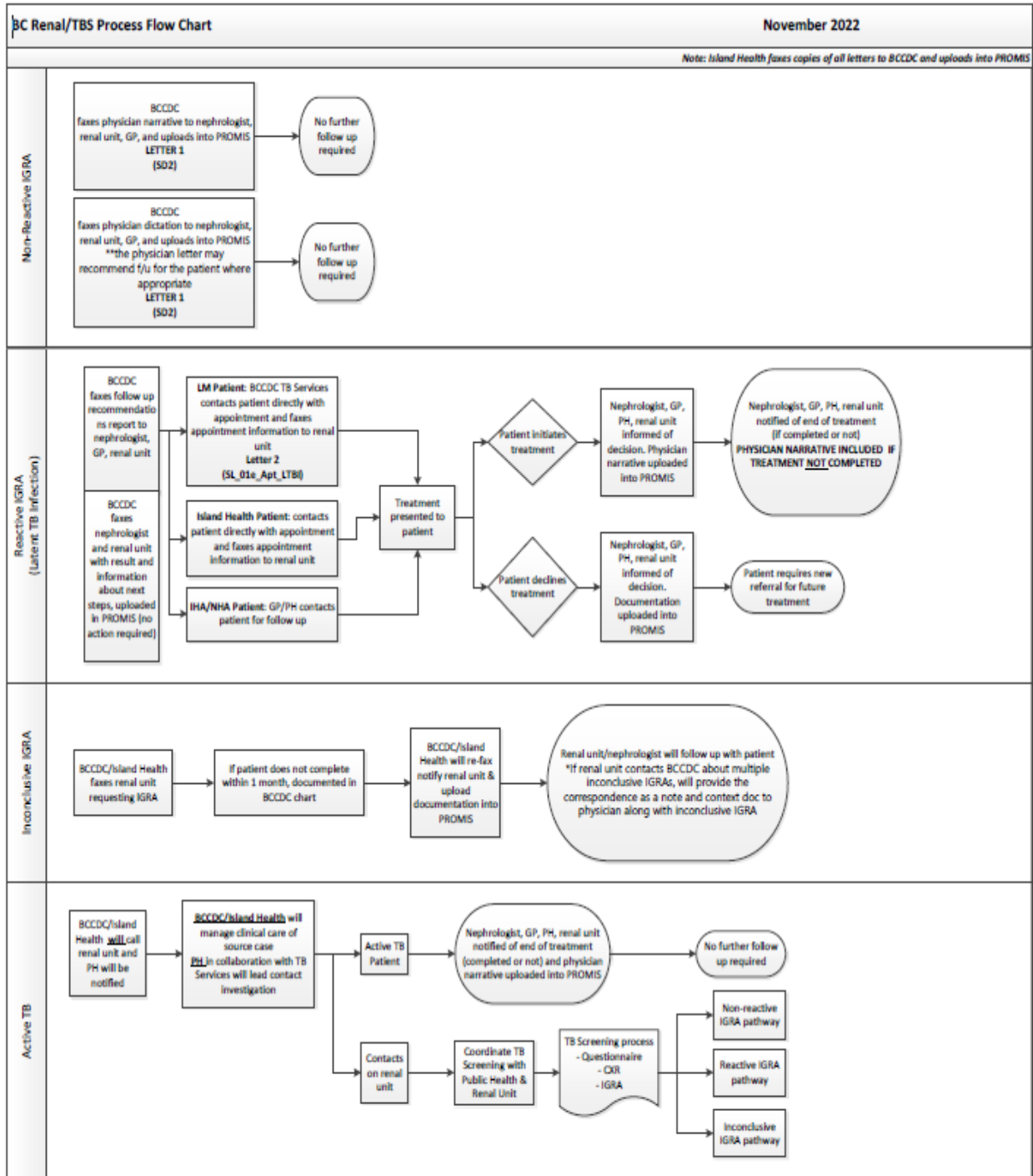
Notes:

1. If the QuantiFERON tubes are collected after other bloodwork is collected (e.g., q6 weeks), there is no need to use the tall red tube as a purge tube
2. Do not use the Nil tube as a purge tube. Tubes are purchased as a set and cost \$20/set.
3. If several tubes in a lot are faulty, notify the Zoonotic Lab of the lot number for further investigation.

4. If another tube must be used for collection, set aside the remaining tubes in the set for future use, as needed.
5. Check the expiry date of the collection tubes prior to blood collection.
6. Blood tube draw order of Grey, Green, Yellow, and Purple while preferred is not required and should not constitute a recollection if performed in an alternate sequence.

Adapted from: QuantiFERON®-TB Gold Plus [QFT-Plus]- blood collection
www.ndhealth.gov/microlab/docs/QuickGuide_QFT_GenBlood_EN_0411_QF_LR.pdf

Appendix 6: Distribution of Reports/Letters & Follow-Up of Results



Incidental findings: When the ordering provider is from TBS and the chest x-ray has abnormal findings non-related to TB. The physician narrative is completed and a copy of the chest x-ray report will be forwarded to the GP for clinical follow up and nephrologist for clinical context.

Appendix 7: Samples of Follow-Up Reports/Letters

Letter 1: Non-Reactive IGRA Results



TB Screening for this patient was completed.

From the information provided, there is no evidence of TB exposure, infection or disease.

This patient is cleared for TB screening purposes. If the TB Screening Form was initiated prior to immune-suppressing treatments or transplant, these treatments may proceed without delay. Please note that IGRA screening is not required if changing to a new biological product, if changing dose or if adding supplementary agents.

Further testing or treatment for TB infection is not recommended at this time. Reassessment would be in accordance with disease specific protocols, if symptoms develop or at the discretion of a physician.

Letter 1 (SD2)

Letter 2: Reactive IGRA Results (Latent TB Infection)

This letter applies to Lower Mainland Patients only.



Clinical Prevention Services
Provincial Tuberculosis Services

BC Centre for Disease Control
Provincial Health Services Authority

Vancouver
655 West 12th Avenue
Vancouver, B.C.
Canada, V5Z 4R4
Tel #: (604) 707-2692
Fax #: (604) 707-2690

New Westminster
#100 – 237 East Columbia Street
New Westminster, B.C.
Canada, V3L 3W4
Tel #: (604) 707-2698
Fax #: (604) 707-2694

Month Day, Year

Attn Pt Full Name
c/o Pt Address

Re Appointment

Dear Pt First Name:

Screening tests show that you *may* have sleeping or dormant TB germs in your body. This is called latent TB infection (LTBI). We'd like to talk to you about options for keeping you healthy.

To learn more, please read the LTBI fact sheet (enclosed) and watch the TB germ video www.bccdc.ca/TBVideos (available in English, Korean, Mandarin, Punjabi, Tagalog and Vietnamese).

Your appointment is on **Appt Date at Appt Time**.

NEW WESTMINSTER TB CLINIC
100 237 EAST COLUMBIA
NEW WESTMINSTER, BC V3L 3W4
(604) 707-2698

Please note that this appointment is by:

- Video
- Telephone (Please call our clinic to confirm your phone number before your appointment)
- In person (Please come 15 minutes early to check-in)

If you would like to talk to us another time, please call us at the number above.

Sincerely,
TB Services

Provincial TB Services, Clinical Prevention Services
BC Centre for Disease Control

SL1e

To learn more about tuberculosis (TB), please watch the TB germ video www.bccdc.ca/TBVideos (available in English, Korean, Mandarin, Punjabi, Tagalog and Vietnamese).



A research and teaching centre affiliated with UBC