Section 5: POLICIES RELATED TO TUBERCULOSIS

TITLE/DESCRIPTION:
DIAGNOSING LATENT TUBERCULOSIS: TUBERCULIN SKIN TESTING OR INTERFERON-GAMMA RELEASE ASSAYS

INDEX NUMBER
ICM - V - 01

EFFECTIVE DATE:
01/01/2009
01/01/2013
01/01/2018

APPLIES TO:
All GCC Countries

ISSUING AUTHORITY:
GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)

DEFINITION

To describe the procedure on how to administer and interpret the Mantoux tuberculin skin test (TST) and Interferon-gamma release assay (IGRAs) to diagnose latent tuberculosis infection (LTBI) in high risk areas including pre-employment assessment and as part of Mycobacterium Tuberculosis (MTB) post-exposure evaluation of employees.

REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2014). Chapter 100: Occupational health. In APIC Text of infection control and epidemiology (4th ed.).
2. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2014). Chapter 95: Mycobacteria. In APIC Text of infection control and epidemiology (4th ed.).
3. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2009). Chapter 104: The pregnant healthcare worker. In APIC Text of infection control and epidemiology (4th ed.).
4. Centers for Disease Control and Prevention (CDC). 6th edition U.S. Public Health Service guidelines for TB care guide highlights from core curriculum on tuberculosis: what the clinician should know. 2016.
5. Centers for Disease Control and Prevention (CDC). Targeted tuberculin testing and treatment of latent tuberculosis infection. MMWR, 2000; 49 (NO RR-6).
6. Centers for Disease Control and Prevention (CDC) Divisions of Tuberculosis Elimination. Targeted tuberculin testing and treatment of latent tuberculosis infection. 2005.
7. Testing for Tuberculosis (TB). National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. CDC# CS228179. Downloaded from: http://www.cdc.gov/tb/publications /factsheets/testing/tb_factsheet.pdf.
8. Latent tuberculosis infection: A guide for primary health care providers. U.S. Department of Health and Human Services Centers for Disease Control and Prevention National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention Division of Tuberculosis Elimination Atlanta, Georgia Developed in partnership with Global Tuberculosis Institute at Rutgers, The State University of New Jersey. 2013.

COMMENTS

Indications for TST or IGRA:

1. Persons at high risk for MTB exposure or infection.
2. As part of post-exposure work-up for employees exposed to MTB.
3. Active surveillance for new employees.

NB: Limited data on the use of IGRAs for children younger than 5 years of age and immunocompromised persons.

PROCEDURE

I. Tuberculin Skin Test (TST) is a test that detects individuals infected with MTB.

A. Pretest Counseling

Counsel any employee or patient identified as needing a TST regarding:

1. The indication(s) for testing.
2. The importance of early detection of TB infection.
3. The risks of MTB infection and active disease.
4. The importance of returning for reading the TST within the specified time frame.
5. Indications for positive and negative test results.
6. How to care for the test site.

B. Pre-employment Screening

1. Question candidates regarding past positive test results.
2. Exclude persons who have previous documented positive TST.

C. TST Procedure

All new hires undergo a two-step TST. The procedure is as follows:

1. Equipment and materials

a. One (1) cc tuberculin syringe;
b. 26- or 27-gauge needle;
c. ½ inch (16 mm) long;
d. alcohol swabs; and
e. measurement tool marked in millimeters.

2. Administration

The Mantoux test is the recommended TST. It is administered intradermally by injecting 0.1 ml containing 5 TU of purified protein derivative (PPD) solution intradermally into the volar surface of the forearm using a 27-gauge needle with a tuberculin syringe.

a. Obtain results of all previous TSTs. Ask the patient to describe what the test area looked like 2 to 3 days after administration; obtain documentation.
b. Avoid areas of skin with veins, rashes, or excess hair.
c. Cleanse your hands with alcohol hand rub.
d. Cleanse the area with an alcohol swab, allowing the area to dry.
e. Clean the rubber top of vial before drawing up solution.
f. Inject all of the antigen just below the surface of the skin on the volar surface of the forearm, forming a 6-10 mm wheal (a pale, raised area with distinct edges; has orange peel-like appearance and does not disappear immediately).
g. Avoid covering the area with a bandage or applying pressure to the injection site.
h. If minor bleeding occurs, dab the injection site with a cotton swab.
i. If no wheal forms, or if a wheal forms that is less than 6 mm, the test should be repeated immediately, approximately 2 inches from the original site or on the other arm.
j. Record the date and time on the site of the skin tested.
k. Instruct the patient not to scratch the site but to use a cool compress to relieve any itching or swelling.
l. Give a written appointment card for TST reading. Inform the patient of the importance of returning for a reading of the TST after 48 to 72 hours (2 to 3 days).
m. Provide written information about the TST (a pamphlet or brochure).

3. **Measurement**
   a. Measure the induration (hard bump) rather than the erythema.
   b. Palpate the area with the fingertips, measuring the diameter of induration perpendicular to the long axis of the arm.
   c. Use a ballpoint pen to mark the edges of the induration.
   d. Use a tuberculin skin test ruler or a ruler with millimeter marks to measure the distance between the two points. Refer to Figure 1.

4. **Interpretation of TST results** (Tables 1-V-01 to 3-V)

Table 1-V-01: A TST reaction of ≥5 mm of induration is considered positive in -

1. **HIV-infected persons**
2. **Recent contacts of infectious TB cases**
3. **Persons with fibrotic changes on chest radiograph consistent with prior TB**
4. **Organ transplant recipients**
5. **Those who are immunosuppressed for other reasons (taking an equivalent of ≥ 15 mg/day of prednisone for1 month or more or taking TNF-α antagonists)**

Table 2-V-01: A TST reaction of ≥10 mm of induration is considered positive in -

1. **Recent immigrants (within last 5 years) from high-TB prevalence countries**
2. **Injection drug users**
3. **Residents or employees of high-risk congregated settings (prisons, jails, long-term care facilities for the elderly, hospitals and other healthcare facilities, residential facilities for patients with AIDS, and homeless shelters)**
4. **Mycobacteriology laboratory personnel**
5. **Persons with the clinical conditions previously mentioned**
6. **Children younger than 5 years of age**
7. **Infants, children, or adolescent exposed to adults at high risk for TB disease**

Table 3-V-01: A TST reaction of ≥15 mm of induration is considered positive in -

1. **Persons with no risk factors for TB**

5. Recording and documentation. Refer to Figure 2-V-01.
   a. Record the date that the TST was administered.
   b. Record the brand name of the PPD solution, lot number, manufacturer, and expiration date in the patient's records.
   c. Record results in millimeters of induration (0 mm if there is no induration) rather than as positive or negative.
   d. Record the date and time of reading and the name of the person reading the TST.

6. **Storage and handling**
   a. PPD solution must be kept refrigerated at 36–46°F or 2° to 8°C.
   b. Avoid fluctuations in temperature; do not store in the refrigerator door.
   c. Syringes must be filled immediately prior to administration.
   d. Store and transport the tuberculin in the dark as much as possible and avoid exposure to light.

7. **Key points**
   a. The TST should not be performed on a person who has a documented history of either a positive TST result or treatment for MTB disease or has taken MTB prophylaxis for LTBI.
   b. TST results should only be read and interpreted by a trained healthcare professional. Patients or family members should not be relied upon to measure TST results.
   c. TB disease must be ruled out before initiating treatment for LTBI to prevent inadequate treatment of TB disease.
   d. Chest radiographs help differentiate between LTBI and pulmonary MTB disease in individuals with positive TST results.

II. Interferon Gamma Release Assays (IGRAs)

A. What are they?

1. An IGRA is a blood test that can determine if a person has been infected with TB bacteria.
2. An IGRA measures how strong a person's immunity reacts to TB bacteria by testing the person's blood in a laboratory.

B. Two IGRAs Approved by the United States Food and Drug Administration (FDA)

1. QuantiFeron-TB Gold In-Tube test (QFT-GIT)
2. T-spot TB test (T-Spot)

C. Procedure

1. A blood is collected into special tube using a needle. The blood is delivered to the laboratory as directed by the QFT instructions. The laboratory runs the test and reports the results to the healthcare provider.

2. Interpretations of IGRA results:
   a. Positive IGRA: This means that the person has been infected with MTB bacteria.
      - Additional tests are needed to determine if the person has LTBI or MTB disease.
      - A healthcare provider will then provide treatment as needed.
   b. Negative IGRA: This means that the person's blood did not react to the test and that LTBI of MTB disease is not likely.

Figure 1-V-01:
Administering the Mantoux TST

Administering the Mantoux TST

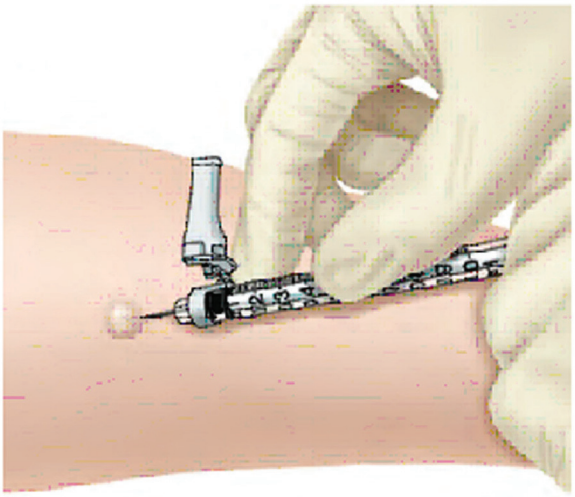


Figure 3.3

Reading the TST Correctly
only the introduction is being measured
This is CORRECT
The correct example below measure 10 mm.

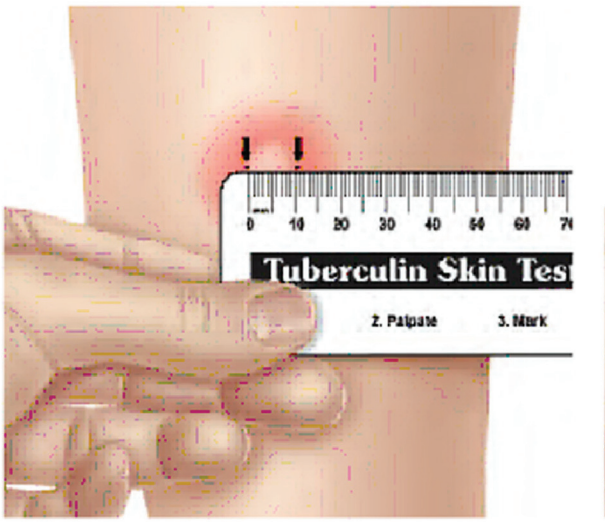


Figure 3.4

Reading the TST Incorrectly
The erythema is being measured
This is INCORRECT
The correct example below measure 30 mm.

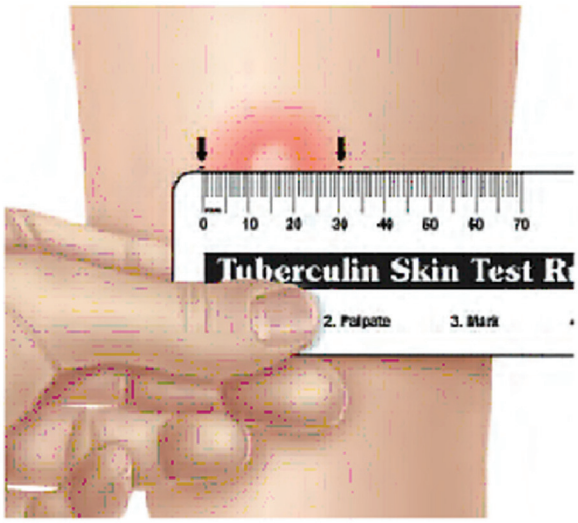


Figure 1-V-01:
Record of MTB Skin Test

To Whom it May Concern:

The following is a record of Mantoux Tuberculin skin testing:

Name: _____ Medical Record No.:_____

Date of birth: _____

Date and time test administered: _____

Lot number: _____

Date and time test read: _____Read by: _____

Results (in millimeters of induration): _____

TITLE/DESCRIPTION:
CONTACT TRACING, SCREENING, AND TREATMENT OF MYCOBACTERIUM TUBERCULOSIS IN HEALTHCARE WORKERS

INDEX NUMBER
ICM -V - 02

EFFECTIVE DATE:
01/01/2009
01/01/2013
01/01/2018

APPLIES TO:
All GCC Countries

ISSUING AUTHORITY:
GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)

DEFINITION

To provide a clear policy on the management of healthcare providers identified with Latent Tuberculosis Infection (LTBI) and to manage healthcare workers exposed to Mycobacterium Tuberculosis (MTB) for proper contact tracing and treatment.

REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2014). Chapter 100: Occupational health. In APIC Text of infection control and epidemiology 4th ed.)

2. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2014). Chapter 95: Mycobacteria. In APIC Text of infection control and epidemiology (3rd ed.)

3. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2014). Chapter 104: The pregnant healthcare worker. In APIC Text of infection control and epidemiology (4th ed.)

4. Centers for Disease Control and Prevention (CDC). 6th edition U.S. Public Health Service guidelines for TB care guide highlights from core curriculum on tuberculosis: what the clinician should know, 2016.

5. Centers for Disease Control and Prevention (CDC). Targeted tuberculin testing and treatment of latent tuberculosis infection. MMWR, 2000; 49 (NO RR-6).

6. Centers for Disease Control and Prevention (CDC). Update Guidelines for Using the Quantiferon-TB Gold Test for Detecting Mycobacterium tuberculosis infection, United States MMWR 2005;54(No. RR-49-55).

COMMENTS

1. All employees must have their Latent Tuberculosis Infection (LTBI) status identified upon employment which includes the Tuberculin skin testing (TST) or the Interferon-Gamma Release Assays (IGRAs) refer to **ICM-V-01** Diagnosing LTBI: TST or IGRAs. This information should be readily available to the infection control program in case an exposure within the health care facility is identified.

2. A close contact is defined as a person who had close, regular, prolonged contact with the MTB patient while he or she was infectious without wearing a proper PPE, especially in small, poorly ventilated place.

3. All employees must report to the Surveillance Clinic if they have any symptoms suggestive of tuberculosis infection (cough ≥3 weeks in duration, especially in the presence of weight loss, night sweats, haemoptysis, anorexia or fever) or if they have experienced exposure to smear-positive patients.
4. An infectious MTB patient is a patient with open pulmonary or laryngeal MTB or with an open draining (extra-pulmonary TB) wound.

PROCEDURE

A. Contact Tracing of Exposed HCWs to an Infected MTB Patient

A close contact is defined as a person who had close, regular, prolonged contact with the MTB patient (i.e., pulmonary or laryngeal TB with a positive sputum smear) while he or she was infectious without wearing a proper personal protective equipment in a small, poorly ventilated place. They should be evaluated immediately for active MTB disease and LTBI.

1. Micro-laboratory notifies Infection Prevention & Control (IP&C) Department of any positive smear from respiratory secretions of MTB disease.

2. IP&C Department is responsible to identify a list of exposed HCWs with their respective Medical record number (MRNs) and forward it to the Surveillance clinic.

3. Surveillance clinic physician assess all contacts clinically to rule out active MTB.

4. Exposed employees with no active MTB symptoms will undergo either a TST or IGRAs test to rule out LTBI.

5. Those with positive TST or IGRA test result should be counseled to start LTBI prophylaxis.

B. Management of Exposed Healthcare Workers with Latent Tuberculosis Infection (LTBI)

Healthcare workers (HCWs) who have positive TST or IGRAs are considered to have LTBI.

1. Counsel HCWs for the need of taking TB prophylaxis.
2. Order chest x-ray, CBC, ESR and liver function test prior to the start of the prophylaxis.
3. Emphasize regular follow up to ensure compliance to treatment protocols.
4. HCWs who have previous documentation of adequate treatment for LTBI do not need to be retreated. Restarting treatment is indicated for the following situations:
    a. Indicated for persons at high risk of becoming re-infected and progressing to MTB disease (e.g., immunocompromised persons).
5. Provide the patient with documentation of results and completion of treatment therapy including their names, date of treatment, chest radiograph, dosage and duration of medication.
6. Educate patients about signs and symptoms of MTB disease and advise them to contact their healthcare provider if he or she develops any of these signs and symptoms.
7. Regardless of whether the patient completes the prophylaxis for LTBI, serial chest radiographs are not indicated unless the patient develops signs and symptoms suggestive of MTB disease.

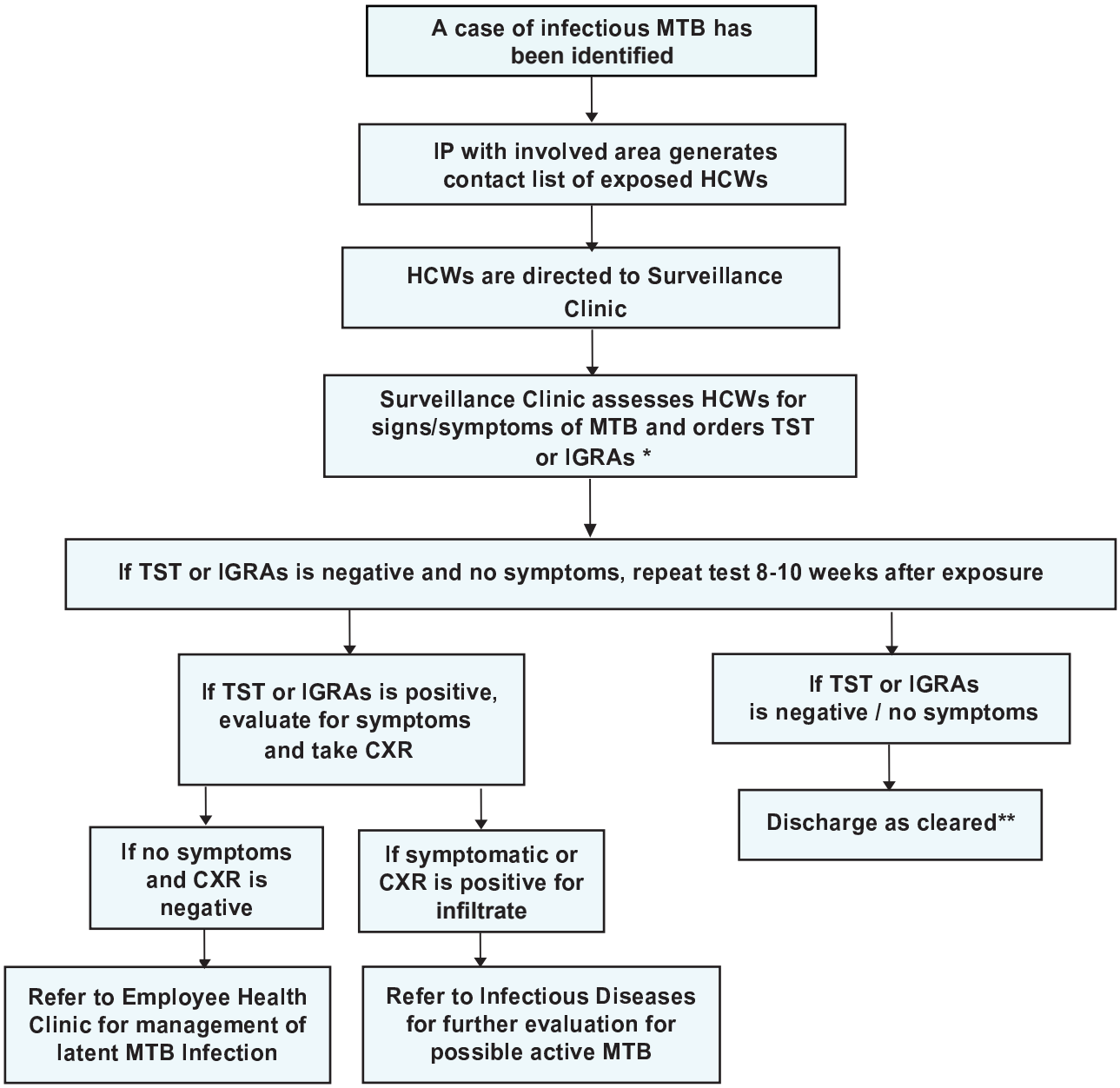
C. Tuberculin Skin Testing (TST) Administration and Interpretation

Refer to **ICM-V-01** Diagnosing LTBI: TST or IGRAs

D. Interferon-Gamma Release Assays (IGRAs)

Refer to **ICM-V-01** Diagnosing LTBI: TST or IGRAs

Flowchart 1-V-02:
Contact Screening of HCWs Exposed to an Infectious MTB



NB:

* Only one method of screening should be chosen either TST or IGRA and not both.

* * Educate patients about the signs and symptoms of TB disease and advised to contact

TITLE/DESCRIPTION:
MANAGEMENT OF SUSPECTED/CONFIRMED CASES OF INFECTIOUS MYCOBACTERIUM TUBERCULOSIS

INDEX NUMBER
ICM -V - 03

EFFECTIVE DATE:
01/01/2009
01/01/2013
01/01/2018

APPLIES TO:
All GCC Countries

ISSUING AUTHORITY:
GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)

DEFINITION

To outline the steps to be taken when admitting patients with suspected/confirmed infectious Mycobacterium Tuberculosis (MTB) from the Emergency Room or Ambulatory Care area as well as during their subsequent management.

REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2014). Chapter 95: Mycobacteria. In APIC Text of infection control and epidemiology (4th ed.).
2. Centers for Disease Control and Prevention (CDC). Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Healthcare Settings. MMWR. 2005.
3. HICPAC/CDC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare setting, 2007.

COMMENTS

1. Risk factors for tuberculosis:
   a. Living in an area endemic for MTB.
   b. History of incarceration or IV drug use.
   c. History of exposure to tuberculosis.
   d. History of untreated or inadequately treated tuberculosis.
   e. HIV infection.
   f. End-stage renal disease patients
2. For confirmed cases of infectious MTB, an N-95 mask should be utilized by the HCWs.
3. HCWs who are at first point of contact in facilities that serve populations at risk for MTB should be trained to ask questions that will facilitate the identification of patients with signs and symptoms suggestive of MTB.
4. Airborne infection isolation room (AIIR) formerly known as negative pressure isolation room is a single-occupancy patient-care room used to isolate persons with suspected or confirmed airborne infectious disease.

PROCEDURE

A. The Triage Process in the Emergency Room and the Ambulatory Care Area

1. Identify promptly patients who are suspected or confirmed to have pulmonary or laryngeal MTB at the time of triage and promptly provide a surgical mask to prevent the risk of infecting others.
2. Follow airborne precautions such as wearing an N95 mask while the diagnostic evaluation is being conducted for these patients:
   a. Place these patients in a separate area apart from other patients, ideally an AIIR or a negative pressure room, and not in an open waiting area.

b. Use a single room temporarily in the absence of an AIIR. Provide the patient with a surgical mask and instruct him/her on how to use them.
c. Educate patients on cough etiquette and respiratory hygiene.
d. Instruct patients, family, and sitters about the importance of such precautions.

NB: AIIR(s) should be available in the ambulatory care setting where patients with MTB are frequently examined or treated.

B. The Admission Process

1. Place a surgical mask on any patient with suspected or confirmed infectious MTB and admit him/her to an AIIR.
2. Perform a chest X-ray to rule out the presence of cavitary lesions, which are indicative of infectivity.
3. For a suspected patient with pulmonary or laryngeal MTB, 3 sputum specimens should be collected over 8 to 24 hours (one must be an early morning specimen) and sent for AFB testing.

C. Isolation Precautions for Admitted Patients

1. Place the patient in a single AIIR (negative pressure room).
2. Keep the patient in his/her room at all times. If the patient must leave the room, he/she must wear a surgical mask.
3. Ensure that doors and windows are closed at all times to maintain negative pressure.
4. Limit the number of individuals entering the room.
5. HCWs must wear an N-95 mask prior to entering the room.
6. Educate HCWs and visitors regarding the importance of adherence to these policies.

D. Patient Transport

1. The transport of suspected and confirmed cases should be kept to an absolute minimum.
2. Keep the patient in the room during the infectious period; if patient is to be transported refer to **ICM-III-09** Transporting Patients on Isolation Precautions.
   a. Place a surgical mask on the patient if he/she is to leave the room.
   b. Limit the transport of patients to essential medical purposes.

E. Discontinuation of Isolation Precautions

1. Suspected patients:
   a. Collected 3 sputum samples are AFB smear negative.
   b. There is no more clinical suspicion of active MTB.
2. Confirmed MTB patients:
   a. After two weeks of medical therapy with clinical improvement.
   b. Have 3 sputum samples which are AFB smear negative.

NB: Consult with the Infection Preventionist (IP) prior to discontinuing isolation.

TITLE/DESCRIPTION:	INDEX NUMBER
MANAGEMENT OF PATIENTS WITH INFECTIOUS MYCOBACTERIUM TUBERCULOSIS IN THE OPERATING ROOM	**ICM - V - 04**

EFFECTIVE DATE:	APPLIES TO:	ISSUING AUTHORITY:
01/01/2009 01/01/2013 01/01/2018	**All GCC Countries**	**GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)**

DEFINITION

To describe precautionary measures needed to be taken when surgical procedures are being performed on infectious Mycobacterium Tuberculosis (MTB) patients.

REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2014). Chapter 95: Mycobacteria. In APIC Text of infection control and epidemiology (4th ed.)
2. Centers for Disease Control and Prevention (CDC). Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Healthcare Settings MMWR. 2005.
3. Centers for Disease Control and Prevention (CDC). Control of tuberculosis in the United States. American Thoracic Society. 1992: 146; 1623-1633.
4. HICPAC/CDC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare setting, 2007.

COMMENTS

1. Only emergency procedures are recommended for patients with active MTB.
2. Elective operative procedures on patients who have MTB should be postponed until the patient is no longer infectious.
3. Communicate the isolation status of the patient so that Operating Room (OR) personnel are aware of the precautions to follow prior to the arrival of the patients in the OR.

PROCEDURE

Operating Room (OR)

1. If possible, perform procedures in operating rooms that have anterooms. For operating rooms without anterooms, the doors to the operating room should be closed, and traffic into and out of the room should be minimal to reduce the frequency of opening and closing the door. Attempts should be made to perform the procedure at a time when other patients are not present in the operative suite and when the minimum number of personnel are present (e.g., at the end of the day). Follow terminal cleaning based on **ICM-X-07** Housekeeping.
2. OR personnel should wear N95 masks throughout the procedure.
3. If a negative pressure room is not available, let the patient recover in the operating room. Or alternatively, in a private room with a portable high-efficiency particulate air (HEPA) filter.

TITLE/DESCRIPTION:
TRACING CONTACTS OF INFECTIOUS MYCOBACTERIUM TUBERCULOSIS FOR NON-HEALTHCARE WORKERS

INDEX NUMBER
ICM - V - 05

EFFECTIVE DATE:
01/01/2009
01/01/2013
01/01/2018

APPLIES TO:
All GCC Countries

ISSUING AUTHORITY:
GULF COOPERATION COUNCIL – CENTRE FOR INFECTION CONTROL (GCC-CIC)

DEFINITION

To outline the process for investigating and screening exposed contacts (non-healthcare workers) of infectious Mycobacterium Tuberculosis (MTB) patients.

REFERENCES

1. Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2014). Chapter 95: Mycobacteria. In APIC Text of infection control and epidemiology (4th ed.).
2. Centers for Disease Control and Prevention (CDC). Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Healthcare Settings MMWR. 2005.
3. Centers for Disease Control and Prevention (CDC). Control of tuberculosis in the United States. American Thoracic Society. 1992: 146; 1623-1633.
4. HICPAC/CDC Guidelines for isolation precautions: preventing transmission of infectious agents in healthcare setting, 2007.

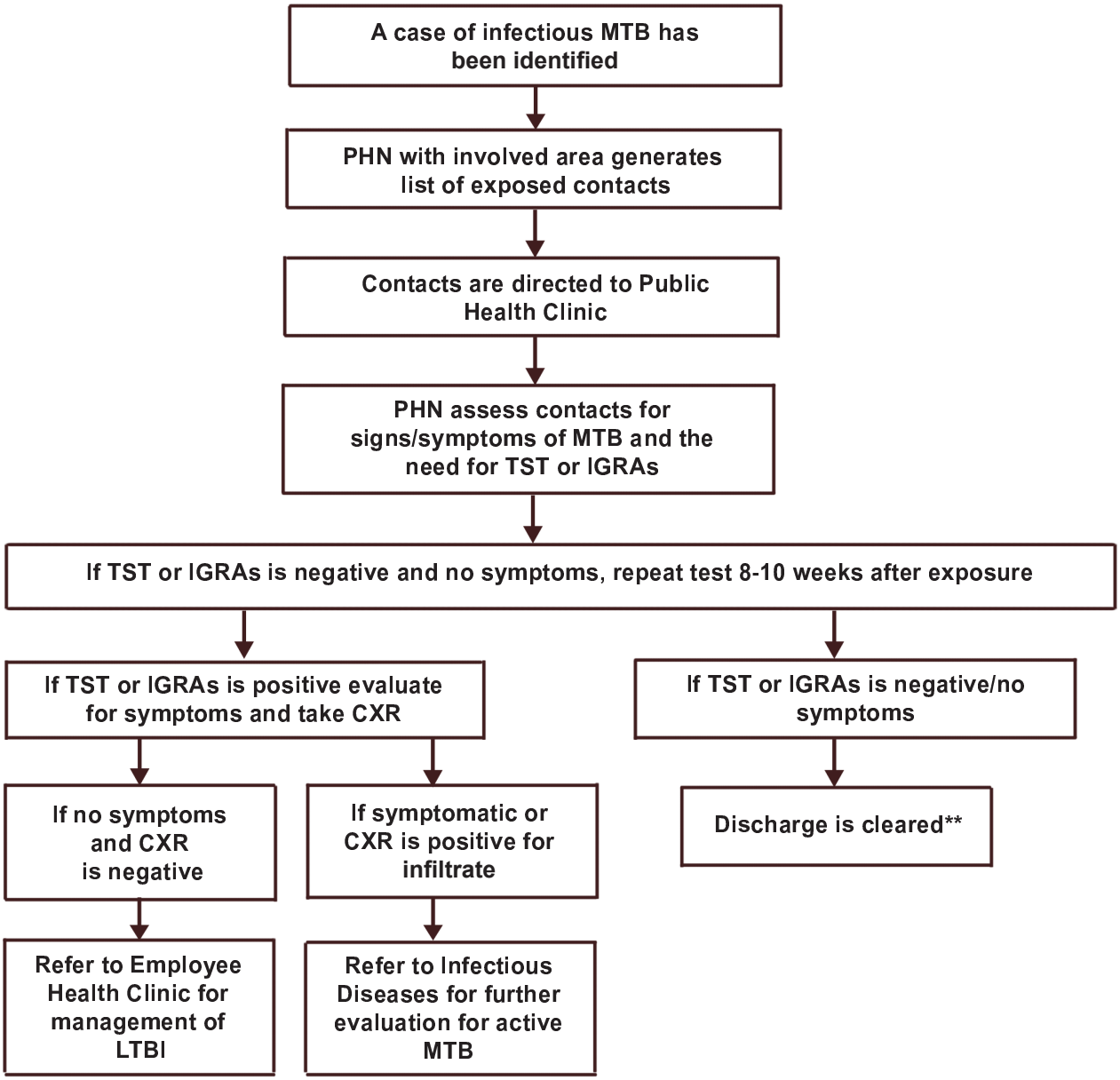
COMMENTS

1. All persons who are close contacts of a confirmed infectious Mycobacterium tuberculosis cases will be investigated for possible acquisition of the disease.
2. A close contact is defined as a person who had close, regular, prolonged contact with the MTB patient while he or she was infectious without wearing proper personal protective equipment in a small, poorly ventilated place.
3. After screening all other close contacts of the index case, the Public Health Nurse (PHN) will refer them to the Public Health clinic to rule out active MTB or latent tuberculosis infection (LTBI).
4. The PHN will provide education regarding the signs and symptoms of the disease and the need for screening.

PROCEDURE

1. Refer to **Flowchart 1–V-05** Tracing Contacts of Infectious Mycobacterium Tuberculosis for Non-Healthcare Workers.
2. Refer to **ICM–V-02** Contact Tracing, Screening, and Treatment of Tuberculosis for Healthcare Workers.

Flowchart 1-V-05:
Tracing Contacts of Infectious MTB Patients other than HCWs



Abbreviation:

HCW	-	Healthcare Worker
ID	-	Infectious Disease
PHN	-	Public Health Nurse
CXR	-	Chest X-ray
LTBI	-	Latent Tuberculosis Infection
TST	-	Tuberculin Skin Test
IGRAs	-	Interferon-Gamma Release Assays