GUIDELINES ON PREVENTION AND MANAGEMENT OF TUBERCULOSIS FOR HEALTH CARE WORKERS IN MINISTRY OF HEALTH MALAYSIA

Occupational Health Unit
Disease Control Division
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1. Jensen, P.A, Lambert, L. A, Iademarco, M.F, et. al. Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* In Health-Care Settings, 2005. MMWR Recommendations and Report. CDC, 30th December 2005 / 54(RR17);1-141
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CHAPTER 1 - INTRODUCTION

1.1. GENERAL INTRODUCTION

Under the *OCCUPATIONAL SAFETY AND HEALTH ACT 1994 (OSHA)*, employers, employees and self employed persons in Malaysia have a duty of care towards their own safety and health, and to that of others at their workplace. Under *OSHA 1994* employers now also have an obligation to identify workplace hazards, to assess the associated risks and to control those risks. Recent increases in the incidence of tuberculosis (TB) among Ministry of Health workers, have led to greater concern about the risk of *Mycobacterium tuberculosis* (*M. tuberculosis*) transmission in health care settings (nosocomial transmission) **(Table 1)**

Table 1 – Estimated Incidence of Tuberculosis among Ministry of Health Workers Year 2007-2010

	YEAR			
	2007	**2008**	**2009**	**2010**
INCIDENCE (Per 100,000 workers)	65.71	80.59	71.42	97.86
NO OF CASES	92	119	124	182

Source: TBIS, CDC Section, Disease Control Division. 2011

Studies of the risk of nosocomial transmission of *M. tuberculosis* performed in developing countries have shown that HCWs caring for infectious TB patients are at risk of *M. tuberculosis* infection and disease. Nonexistent or ineffective TB infection control (IC) measures facilitate *M. tuberculosis* transmission in these health care settings.

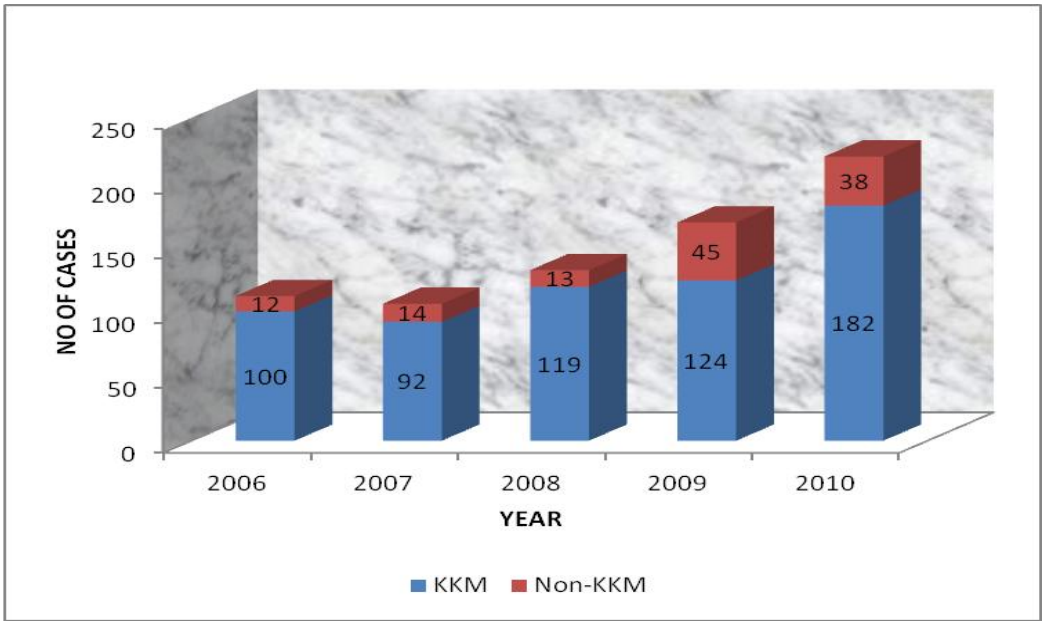
A review of the most common factors contributing to *M. tuberculosis* transmission in health care facilities at the district and referral levels in the developing world shows that many can be remedied with simple and, in many instances, inexpensive control measures (W.H.O, 1999).

1.2. RATIONALE

This guideline is produced because:

1. There is an increase incidence of TB among Ministry of Health workers **(Table 1).**
2. The increase in the incidence of TB among Ministry of Health workers is likely to be work related, since investigation showed the source of infection was found to be more from health care facilities than from outside **(Diagram 1).**
3. Currently no specific TB prevention program in health facilities.
4. Current TB program emphasize more on detection and treatment (i.e. contact tracing) but less emphasize on prevention program at the workplace.

Diagram 1 – Distribution of TB Cases among Healthcare Workers Year 2006 to 2010



Source: TBIS, CDC Section, Disease Control Division, 2011

This guideline was prepared based on the recommendations given in:

- CDC Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* In Health-Care Settings, 2005.
- World Health Organization Guidelines for the Prevention of Tuberculosis 1999.
- Guidelines for the Prevention of Tuberculosis in Health Care Facilities in Resource-limited Settings. 1999
- Tuberculosis in Infection Control in the Era of Expanding HIV Care and Treatment. CDC USA WHO US President's Emergency Plan for AIDS Relieve
- International Union Against Tuberculosis and Lungs Diseases
- Consensus of a group of medical personnel's from various specialties, including respiratory medicine.

1.3 OBJECTIVES

General Objective

To provide a guideline in the prevention and control of TB infections among HCWs.

Specific Objectives

1. To prevent occupational related TB among HCWs
2. To reduce the risk of TB transmission between patients to HCWs and vice versa in a health-care setting
3. To promote and improve TB control measures in health-care setting

1.4. DEFINITION

1.	Administrative controls	Defined as the managerial or administrative measures (e.g. early diagnosis, prompt isolation or separation of infectious TB patients, prompt initiation of appropriate anti-tuberculosis treatment) to reduce significantly the risk of TB transmission by preventing the generation of droplet nuclei.
2.	Airborne infection isolation (AII) room	Single patient room with negative pressure ventilation where infectious TB patients can be isolated from other patients.
3.	Air changes per hour (ACH)	Air change rate expressed as the number of air exchange units per hour, equivalent to the ratio of airflow in volume units per hour to the volume of the space under consideration in identical volume units. The equation is I = 3600 Q/V, units of 1/time. where I = air change rate per hour Q = fresh air flow through the room (m^3/s) V = volume of the room (m^3)
4.	Environmental Controls	Measures that can be used in high-risk areas to reduce the concentration of droplet nuclei in the air (e.g. maximizing natural ventilation or controlling the direction of airflow)
5.	Health care workers (HCWs)	Group of people that include nurses, physicians, nursing and medical students, dental workers, laboratory workers and others who work in health care facilities.

6.	HCWs at risk of TB	All HCWs who are exposed to patients with suspected or confirmed TB disease (including transport staff) or dealing with specimen for the diagnosis of TB. These work areas include: • In-patient settings: wards, intensive care units, operation theatres, laboratories, bronchoscopy rooms, sputum induction or inhalation rooms, autopsy rooms and embalming rooms. • Outpatient settings: TB treatment facilities, chest clinics, outpatient clinics, pharmacies, emergency departments, dialysis units and dental care settings. • Others include housekeeping and food service staff
7.	Health care facilities	Hospitals and Health Clinics under Ministry of Health Malaysia
8.	Infectious TB patients	The following characteristics exists in a patient with TB disease that increases the risk for infectiousness ▪ presence of coughing; ▪ have cavitations on chest radiograph; ▪ have positive AFB sputum smear results; ▪ have respiratory tract disease with involvement of the lung, pleura or airways, including larynx, ▪ failure to cover the mouth and nose when coughing; ▪ are not on antituberculosis treatment ▪ are on incorrect antituberculosis treatment; ▪ undergoing cough-inducing or aerosol-generating procedures (e.g., sputum induction, bronchoscopy, and airway suction).

9.	Mantoux test conversion	A change in the result of a test for *M. tuberculosis* infection wherein the condition is interpreted as having progressed from uninfected to infected. An increase of more or equal than 10 mm in induration from baseline during a maximum of 2 years is defined as a Mantoux test conversion for the purposes of a contact investigation. A Mantoux test conversion is presumptive evidence of new *M. tuberculosis* infection and poses an increased risk for progression to TB disease.
10.	N95 disposable respirator	An air-purifying, filtering-face piece respirator that is >95% efficient at removing 0.3 μm particles and is not resistant to oil.
11.	Negative pressure	The room with negative pressure has a lower pressure than adjacent areas, which keeps air from flowing out of the room and into adjacent rooms or areas. It is the relative air pressure difference between two areas in a health-care facility.
12.	Powered air-purifying respirator (PAPR)	A respirator equipped with a tight-fitting face piece (rubber face piece) or loose-fitting (PAPR) face piece (hood or helmet), breathing tube, air-purifying filter, cartridge or canister, and a fan.
13.	Surgical mask	Triply paper mask that prevents the spread of micro-organisms from the wearer to others; it does not provide sufficient protection from inhaling airborne infectious droplet nuclei.

14. Ventilation - A means of removing and replacing the air in a space. This may be provided by either natural or mechanical means. In its simplest form this may be achieved by opening windows and doors. Mechanical ventilation systems provide a more controllable method.

1.5. PATHOGENESIS, EPIDEMIOLOGY, AND TRANSMISSION OF *M. TUBERCULOSIS*

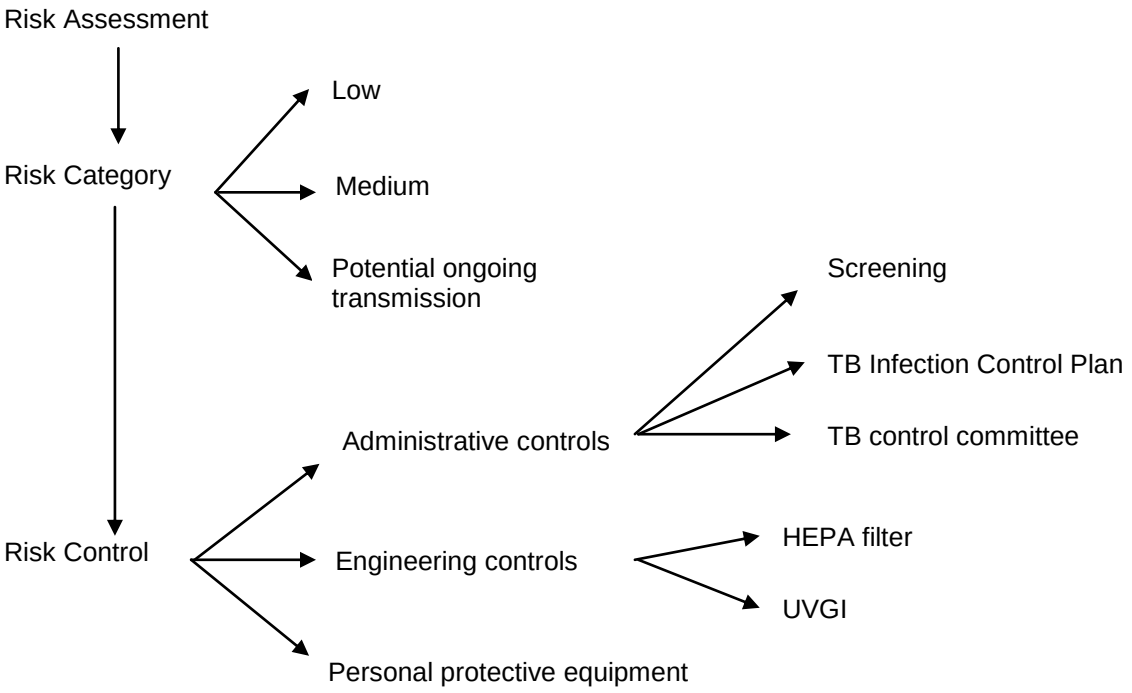
- Tuberculosis (TB) is an infection caused by *Mycobacterium tuberculosis* which is transmitted via airborne particles called droplets nuclei. Droplets only travel for 3 feet before the gravity pulls them to the ground.
- The 1–5 *μ*m droplets nuclei are generated when persons who have pulmonary or laryngeal TB disease cough, sneeze, shout, speak, or spit.
- TB has been recognized as one of the important infectious occupational disease affecting health care workers (HCWs).
- There has been an increasing incidence of TB cases among Ministry of Health Workers (Table 1).
- The risk of TB transmission from one person to the other depends on: -
    - the concentration of infectious droplet nuclei in the air (no permissible level of exposure to TB bacilli)
    - the duration of exposure.
    - characteristics of the TB pt
    - environmental factors
    - characteristics of the person exposed to MTB
- The chain of transmission to HCWs can be reduced by isolating patient with active disease, starting effective anti-tuberculosis treatment and taking appropriate control measures.

CHAPTER 2 - TB INFECTION CONTROL STRATEGIES

The control measures are based on a three – level hierarchy of controls which are:

1. Environmental controls
2. Administrative controls (managerial)
3. Personal protective equipment

Diagram 2. – Prevention of TB Infection Among HCWs



2.1. ENVIRONMENTAL CONTROL MEASURES AT HEALTH CARE FACILITIES

Certain areas of the health care facility can be considered as high risk and priority should be given in implementing environmental controls. Examples of high risk areas:

- Isolation rooms
- Treatment rooms
- HIV care facilities
- Immunocompromised patient care areas
- TB wards & clinics
- Intensive Care Unit where TB patients may receive treatment
- Sputum Induction Room
- Bronchoscopy Suites
- Operating Rooms
- Accident & Emergency
- Outpatient department
- Laboratories
- Radiology department

Environmental controls (EC) are important to prevent the spread and reduce the concentration of infectious droplet in the air.

A variety of simple to complex EC can be used to reduce the number of aerosolized infectious droplet nuclei in the work environment:

- The simplest and least expensive technique is by maximizing natural ventilation through open windows
- More complex and costly methods involves the use of mechanical ventilation i.e. local exhaust ventilation (LEV) and negative pressure rooms which may include HEPA filtration to remove infectious particles and the use of ultraviolet germicidal irradiation (UVGI) to sterilize the air.

2.1.1 Types of Environmental Control Measures

There are 2 approaches to environmental control which are:

1. **Primary** – Control source of infection by using local exhaust ventilation and diluting and removing contaminated air by using general ventilation

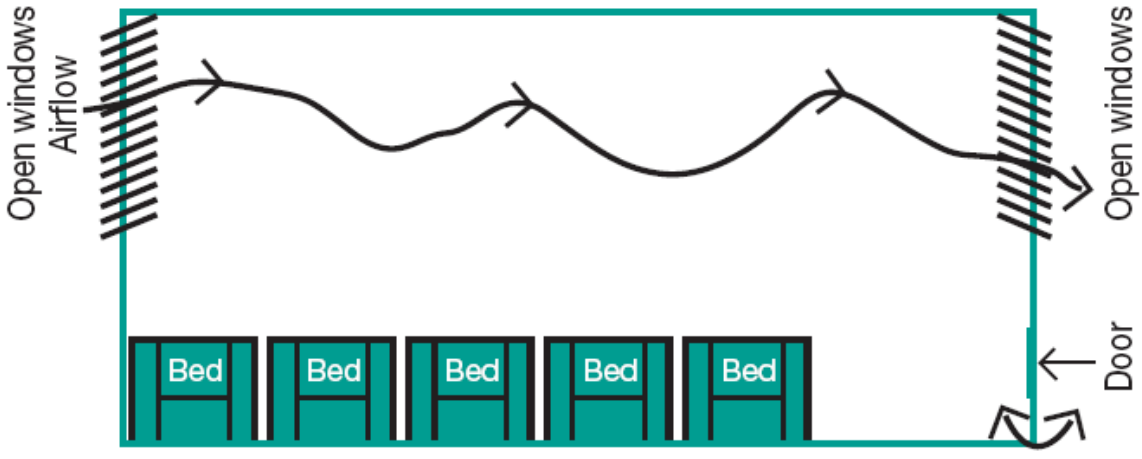
2. **Secondary** – Control airflow to prevent contamination of air in areas adjacent to source (AII Room) and cleaning the air by using 'high efficiency particulate air' (HEPA), filtration or 'ultraviolet germicidal irradiation' (UVGI).

(i) Primary (Diagram 3.1)

a) Diluting and removing contaminated air by using general ventilation. Natural ventilation is one of mechanism under the general ventilation.

- Maximizing natural ventilation patterns for the hospital, clinic, ward or room is the simplest approach to achieving better ventilation.
- Whenever possible, waiting areas, sputum collection areas, examination rooms, and wards should be "opened" to the environment (e.g. established in covered open areas or in areas with open windows).
- This is not recommended for highly pathogenic organism e.g. SARS virus and toxic chemicals.

Diagram 3.1. Natural ventilation; free flow of ambient air in and out through open windows



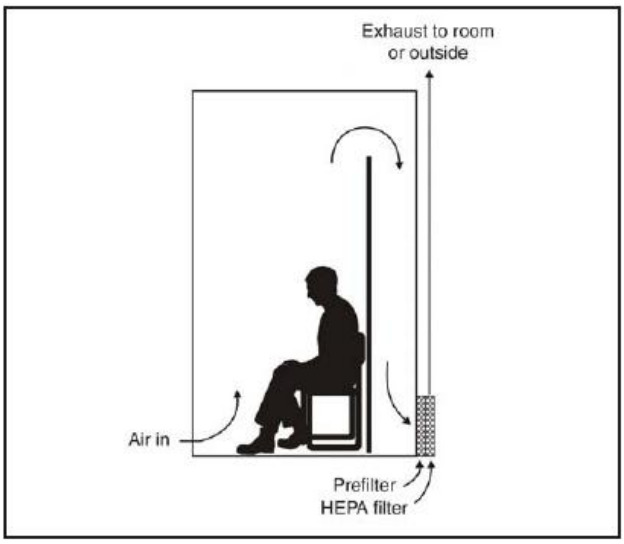
b) Control source of infection by using local exhaust ventilation (LEV) **(Diagram 3.2).** Local exhaust ventilation captures airborne contaminants at or near their source and removes the contaminants without exposing persons in the area to infectious agents. This method is considered the most efficient way to remove airborne contaminants because it captures them before they can disperse. In local exhaust devices, hoods are typically used. Two types of hoods are:

- Enclosing devices, in which the hood either partially or fully encloses the infectious source includes:
  - booths for sputum induction or administration of aerosolized.
  - tents or hoods for enclosing and isolating a patient.
  - biological Safety Cabinets.

- Exterior devices, in which the infectious source is near but outside the hood. Exterior devices for local exhaust ventilation are usually hoods that are near to but not enclosing an infectious patient. Whenever possible, the patient should face directly into the opening of the hood to direct any coughing or sneezing into the hood. The device should maintain an air velocity of 200 feet per minute (fpm) at the patient's breathing zone to ensure the capture of droplet nuclei.

Air from booths, tents, and hoods is preferably discharged outside. If the exhaust air is discharged into the room, a HEPA filter should be incorporated at the discharge duct or vent of the device. If a device does not incorporate a HEPA filter, the air from the device should be exhausted directly to the outside and away from air-intake vents, high risk unit, persons, and animals.

Diagram 3.2. An enclosing booth designed to sweep air past a patient with tuberculosis disease and collect the infectious droplet nuclei on a high efficiency particular air (HEPA) filter



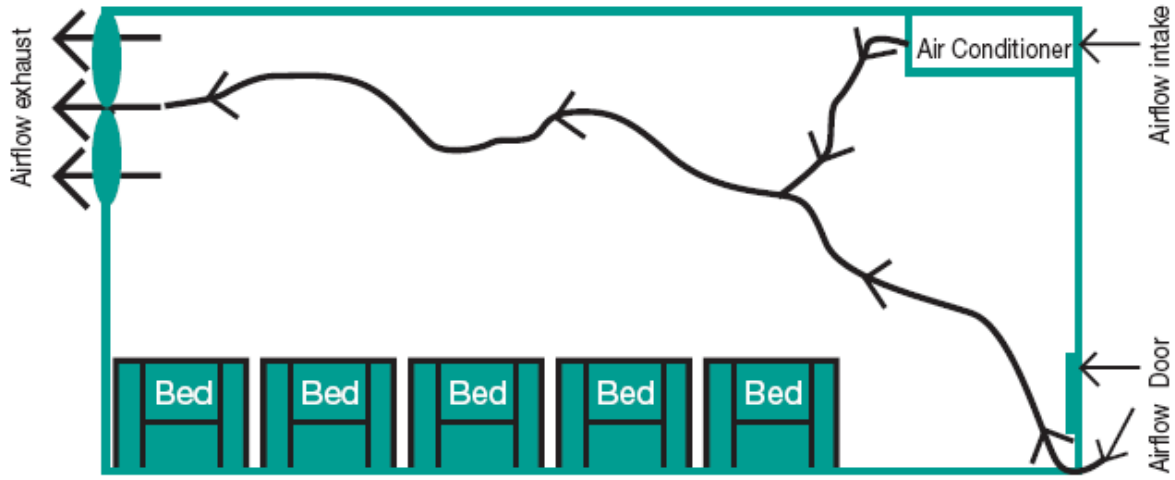
Source: Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* In Health-Care Settings, 2005. MMWR Recommendations and Report. CDC, 30th December 2005 / 54(RR17);1-141

(ii) Secondary

a. Control airflow to prevent contamination of air in areas adjacent to source. **(Diagram 3.3)**

- To reduce nosocomial risk, the most ideal situation would be one in which fresh air is constantly pulled into a room and the contaminated air is exhausted to the outside, such that the air in the room is changed several times every hour. The most common way is to establish a negative pressure room.
- Directional air flow should be maintained from clean air intake area, across the HCW, across the patient, and filtered before exhausted outside
- An airlock or anteroom is required to maintain the negative pressure of the room.

Diagram 3.3 Negative pressure rooms; diagram illustrating airflow from outside a room, across patients' beds and exhausted out the far side of the room

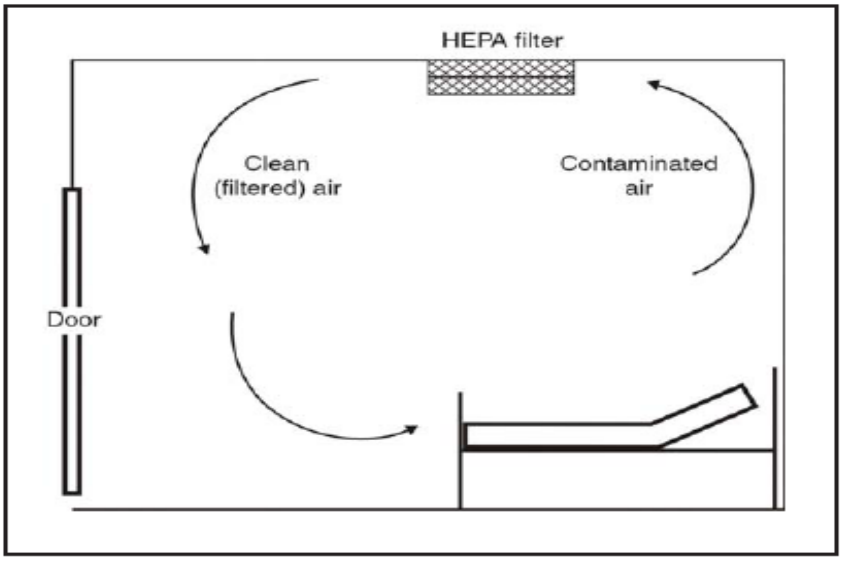


Direction of air flow under the door: negative pressure with respect to corridor.

b. Cleaning the air by using 'high efficiency particulate air' (HEPA) filtration. **(Diagram 3.4)**
   - HEPA filters can remove infectious droplet nuclei from air that is re-circulated in a setting or exhausted directly to the outside.
   - HEPA filters must provide a minimum removal efficiency of 99.97% of particles equal 0.3um in diameter.
   - It can be used to supplement other recommended ventilation measures and as an adjunct to other ventilation measures.
   - HEPA filters may be free standing (portable room-air recirculation unit) or may be permanently attached to floors or ceilings to minimize tampering.
   - In selecting the HEPA filters for an individual room without central ventilation system, consideration should be given to the size of the room, air changes per hour (ACH) and time required to remove the airborne contaminant. Minimum air exchange rate is 6 ACH and maximum is 12 ACH.

- Uses of HEPA filter:
  - discharging air from local exhaust ventilation booths or enclosures directly into the surrounding room or area
  - discharging air from TB Isolation room (or other negative-pressure room) into the general ventilation system (e.g., when ventilation system or building configuration where exhaust to the outside is impossible).
  - as a safety measure in exhaust ducts to remove droplet nuclei from air being discharged to the outside.
- In a central ventilation system, clean air can be achieved by exhausting air from the room into a duct, passing it through a HEPA filter and returning it to the room.

Diagram 3.4. Example of a fixed ceiling-mounted room-air recirculation system using a high efficiency particulate air (HEPA) filter for a room



Source: Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* In Health-Care Settings, 2005. MMWR Recommendations and Report. CDC, 30th December 2005 / 54(RR17); 1-141

c. Sterilize the air by using 'ultraviolet germicidal irradiation' (UVGI).

UVGI is a form of electromagnetic radiation which can kill or inactivate microorganisms so that they are no longer able to replicate and form colonies. Effective dose of ultraviolet-C (UV-C) radiation is at 254.7 nanometers (nm). UVGI;

- Can be used in a room or corridor to irradiate the air in the upper portion of the room (upper-air irradiation)
- Is installed in a duct to irradiate air passing through the duct (duct irradiation) or incorporated into room air-recirculation units.
- Should not be used in place of HEPA filters when discharging air from isolation booths directly into the surrounding room**.**
- Particularly useful in larger wards, TB clinic waiting areas or inpatient areas such as television or recreation rooms where TB patients congregate.
- Bare UVGI bulbs can be used to irradiate the entire room / booth when it is not occupied. If HCWs and patients are in the room, continuous upper air irradiation can be used with shielded UVGI.

2.1.2 Testing and Maintenance of Control Measures

- Testing and maintenance should be carried out according to the specification of the system / product.
- Ventilation systems should be evaluated regularly to determine if they are functioning properly. Evaluations should be documented in a maintenance record.
- Monitoring equipment should be calibrated on a regular basis according to its specification.
- Competent person to do the assessment where required.
- Replacement of defective and expired components of the control system need to done as specified by the manufacturer.

- Local Exhaust Ventilation:
    - The simplest evaluation includes the use of smoke (i.e. smoke tube) to monitor proper air flow direction. Smoke tube should be used to verify that the control velocity at the typical location of patient's breathing zone is adequate.
    - Determine the air velocity and capture velocity regularly
- Air Cleaning Devices:

    (i) HEPA
    - Used HEPA filters must be disposed as clinical waste.
    - Filter need to be checked and replaced according to the manufacturer recommendation

    (ii) UVGI
    - Maintaining the tube free from dust and organic matter

2.2 ADMINISTRATIVE CONTROL

The administrative controls are important measures to reduce the risk of exposure of HCWs and patients to *M. Tuberculosis.* Administrative controls consist of the following activities:

2.2.1 TB Infection Control Committee:

- Initiate a TB Infection Control Committee, which can be incorporated to the existing Infection Control Committee. The committee should be established throughout the states for all hospitals and health clinics, and responsible to develop and implement the TB Infection Control Program.
- Train the persons responsible for implementing and enforcing the TB Infection Control Program.
- Designate one person with a back-up as the TB resource person to whom questions and problems should be addressed.

2.2.2 TB Infection Control Plan:

Establish a written TB Infection Control Plan. This protocol should include: -

1. Measures to control TB transmission
    a. rapid identification, isolation, diagnostic evaluation and prompt treatment of patients likely to have TB **(Appendix 1).**
    b. comprehensive case investigation and notification.
    c. to follow Safe Operating Procedure for infectious diseases, including transport/transfer of patients **(Appendix 2).**
    d. scheduling procedures for TB patients **(Appendix 2).**
    e. ensure proper cleaning and sterilization or disinfection of potentially contaminated equipment.
    f. environmental control measures (Refer 2.1)
2. Screening and medical surveillance for HCWs at risk.(Refer Chapter 3)
3. Training, educating and counseling HCWs.
4. Personal protective equipments.
5. Periodic evaluation of the program.

2.2.3 Workplace Risk Assessment (Appendix 3)

Every health care setting should conduct initial and ongoing evaluation of the risk for transmission of *M. tuberculosis.* A risk assessment should include the following:

1. Determine risk classification of TB infection at health facility by: -
    a. Review of the community profile of TB disease
    b. Review of the number of TB patients who were treated in each work area during the last 5 years
    c. Review of the drug-susceptibility patterns of TB isolates from patients treated in the facility
    d. Review of laboratory diagnostic capabilities
2. An analysis of screening test for HCWs (Refer to **Figure 1** –Flow Chart of HCW TB Screening Process)

3. An evaluation and auditing of administrative infection control measures, including isolation policies, SOP, antiTB therapy regiments etc.
4. Evaluation of the function and maintenance of environmental controls.
5. Implementation of appropriate control measures.

2.2.4 Triage

- Patients should be triaged in order to separate suspected infectious TB patients from other patients at the clinics or Accident and Emergency waiting areas.
- Avoid placing potentially infectious TB patients in waiting areas with other patients without TB, especially those who are immunocompromised, elderly and children.
- If a separate waiting area cannot be established for them, effort should be made in expediting process or establish a priority service in order to decrease the risk of exposure to other patients and HCW (i.e. reduce the time others are exposed to them)
- HIV positive workers should not work in TB care settings.
- Avoid routine referral of TB patients to HIV testing facilities. These referrals unnecessarily expose people living with HIV at these sites to TB. Instead, HIV testing should be implemented in TB clinics or referral of specimens
- Avoid referring HIV and/or immunocompromised patients/workers for screening and diagnosing TB at TB care facilities to prevent unnecessary exposure except for complicated and challenging cases.
- Avoid locating HIV or any immunocompromised care setting adjacent or near to TB care setting.
- HIV patients/workers should be separated from known TB and coughing patients/workers.
- Only one patient at a time should be allowed in the examination room to reduce the chance of transmitting *M. tuberculosis* to other patients
- Questions which should be asked during triaging:

i. History of TB exposure or disease
ii. Symptoms or signs of TB disease
iii. Medical conditions that increases their risk for TB disease

- Criteria leading to high suspicion for active TB are:
    i. Symptoms suggestive of TB infection: -
        a. Coughing for more than 10-14 days in general population, whilst 7-10 days among the high risk group
        b. Bloody sputum or hemoptysis
        c. Fever, loss of appetite, loss of weight, night sweats and fatigue
        d. Hoarseness of voice
    ii. Contacts with TB patient
    iii. High risk group (e.g. HIV-infected, immunocompromised persons, correctional institutions, elderly, pre-existing chronic respiratory disease)
    iv. Live in area where TB incidence is high
    v. Cavitation on chest radiograph
    vi. Positive AFB sputum smear results

2.2.5 Training and education:

- All HCWs should receive ongoing education at least once a year.
- Content of training:
    i. Basic concepts of *M. tuberculosis* transmission and pathogenesis
    ii. Signs and symptoms of TB
    iii. High risk group
    iv. Importance of infection control plan, responsibility of HCW to implement and maintain infection control practices in order to reduce the risk of *M. Tuberculosis* transmission
    v. Settings with higher risk of *M. tuberculosis* transmission (e.g. Closed examination rooms)
    vi. Safe operating procedure to reduce the likelihood of transmitting *M. Tuberculosis*

2.2.6 Patient education – Cough Hygiene

- Patients should be educated about *M. tuberculosis* transmission and the importance of cough etiquette (i.e. to minimize the generation of infectious droplet nuclei)
- Coughing patients should be instructed to turn their heads and cover their mouth and nose with their hands and preferably with a cloth or tissue when coughing.
- If patients do not have a cloth or tissue, these should be provided by the institution.
- Posters emphasizing cough etiquette should be placed in the waiting areas.

2.3 PERSONAL PROTECTIVE EQUIPMENT (PPE)

- The use of PPE alone (i.e. respirator) should not be used as the main control measures since it can only work if standard work practice and environmental controls are in place.
- Ideally, all HCWs who are involved in the care of infectious TB patient should wear at least N95 disposable mask/respirator. However, in resource limited settings, N95 must be used at least by those working in the high risk areas in hospitals and referral centers as follows
  - TB wards and clinics
  - Isolation room
  - Procedure room (bronchoscopy suite, etc)
  - Operating room.
- The use of face mask (3ply) is a must for all HCW's involved in the care of infectious TB patient where N95 is not provided.

CHAPTER 3 - MANAGEMENT OF WORKER'S HEALTH

3.1 PRE-PLACEMENT MEDICAL EXAMINATION

Introduction

Ministry of Health staffs that are going to work in High Risk TB Area (HRTBA) will have to undergo the pre-placement medical examination.

High Risk TB Areas (HRTBA) are as follows:-

- Medical / Respiratory Wards
- Chest Clinics
- Health Clinics
- Laboratories

They will get the instructions, forms to be filled, undergo TB screening and tests and medical examination by the Chest Clinic/Outpatient Clinic.

The procedures should be completed **within two (2) weeks after** they report for duty.

3.1.1 Hospital (Appendix 4)

1. **Category of staffs**

   Category of new staffs who have to go for Pre-Placement Medical Examination includes (but not limited to):-

   - Medical Officers
   - Staff Nurses / Community Nurses,
   - Medical Assistants,
   - Medical Laboratory Technologist (Microbiology Lab)
   - Health Attendants

2. Responsible persons

The responsible persons should coordinate the briefing for the new personnel's when they are reporting for duty. After reporting for duty, the new staffs shall be instructed to attend Pre-Placement Medical Examination in the Chest Clinic.

Location of Reporting for Duty	Person In-charge
Chest clinic	Medical Officer
Outpatient Department	Medical Officer in charge
Medical / Respiratory Ward	Ward manager
Laboratory	Pathologist

3. Coordinator

- The Chest Clinic should coordinate the procedures and provide the appropriate instructions.

4. Forms to be used and records keeping

- The Pre-Placement Medical Examination form (OHU TB-1) **(Appendix 6)** shall be used for the pre-placement medical examination. The forms shall be placed in the examination rooms.
- After the examination, the form shall be maintained and kept in the Chest Clinic.
- A report shall be submitted to the Occupational and Environmental Health Officer, State Health Department **every month** by using OHU TB 3a **(Appendix 7)** format. The Occupational and Environmental Health Officers (OEHO) of the states shall coordinate all related activities in the states' facilities, including TB audit and monitoring of TB among Health Care Workers. The State OEHO shall submit a report to the Occupational Health Unit, Disease Control Division, Ministry of Health by using OHU TB 4a **(Appendix 8)** format every **six (6) month**.

- If the staff is found to be TB positive, notification of diseases shall use PL 206, WEHU L1 & L2 (JKKP7) and TBIS 10A1.

5. Location of tests

- History taking, symptoms screening and medical examination shall be done in the Chest Clinic.
- Tuberculin Skin Test (TST) and Interferon Gama Release Assay (IGRA) Test shall be done in the Chest Clinic / Outpatient Clinic (or where the services are provided)
- Chest X-ray shall be done in Radiology Department. The radiograph will be reviewed by the Chest Clinic Medical Officer.

6. Type of tests

- Symptoms screening
    - Cough persisting for more than 10 days
    - Cough with sputum which is occasionally blood stained
    - Loss of appetite
    - Loss of weight
    - Fever
    - Dypsnoea, night sweats, chest pain and hoarseness of voice
    - Immunization status (BCG vaccination status)
    - Past medical history with emphasis on previous TB infection or treatment
    - Routine general physical examination
- Tuberculin Skin Test (TST)
- Interferon Gama Release Assay (IGRA) when recommended by Chest Physician
- Chest X-ray (if newly MOH HCW had been radiographed in less than 6 months earlier, the chest radiograph may not need to be done. Instead, the report of the chest radiograph shall be provided to the Chest Clinic Medical Officer to complete the procedures. (Refer Figure 1)

7. Management

After the medical examination, the attending Medical Officer shall certify whether the new personnel's are TB positive or TB negative. If the new personnel's are TB positive, they should be managed according to Clinical Practice Guidelines for the Control and Management of Tuberculosis. TB negative personnel's shall be allowed to work in the areas where they are assigned to.

3.1.2 Health Clinic (Appendix 5)

1. Category of staffs

Category of new staffs who have to go for Pre-Placement Medical Examination includes (but not limited to):-

- Medical Officers
- Staff Nurses / Community Nurses,
- Medical Assistants,
- Medical Laboratory Technologist
- Health Attendants

2. Responsible person

The Medical and Health Officer In-Charge shall be responsible to coordinate the briefing for the new personnel's when they report for duty. After reporting for duty, the new staffs shall be instructed to attend Pre-Placement Medical Examination in the Outpatient Clinic.

3. Coordinator

- The Outpatient Clinic should coordinate the procedures and provide the appropriate instructions.
- Pre-Placement Medical Examination form (OHU TB-1) **(Appendix 6)** shall be given to the staffs involved.

4. Forms to be used and records keeping

- The Pre-Placement Medical Examination form (OHU TB-1) **(Appendix 6)** shall be used for the procedures. The forms shall be placed in the examination rooms.
- After the examination, the form shall be maintained and kept in the Chest Clinic.
- A report shall be submitted to the Occupational and Environmental Health Officer, State Health Department every month by using OHU TB 3a **(Appendix 7)** format. The Occupational and Environmental Health Officers (OEHO) of the states shall coordinate all related activities in the states' facilities, including TB audit and monitoring of TB among Health Care Workers. The State OEHO shall submit a report to the Occupational Health Unit, Disease Control Division, Ministry of Health by using OHU TB 4a **(Appendix 8)** format every 6 month.
- If the staff is found to be TB positive, notification will use PL 206, WEHU L1 & L2 (JKKP7) and TBIS 10A1

5. Location of tests

- Symptoms screening shall be done in Outpatient Clinic.
- TST and IGRA Test shall be done in the Outpatient Clinic (or where the nearest services are provided)
- Chest X-ray shall be done in Radiology Unit. The radiograph shall be reviewed by the Medical Officer In-Charge.

6. Type of tests

- Symptoms screening
    - Cough persisting for more than 10 days
    - Cough with sputum which is occasionally blood stained
    - Loss of appetite
    - Loss of weight
    - Fever

- Dypsnoea, night sweats, chest pain and hoarseness of voice
- Immunization status (BCG vaccination status)
- Past medical history with emphasis on previous TB infection or treatment
- Routine general physical examination

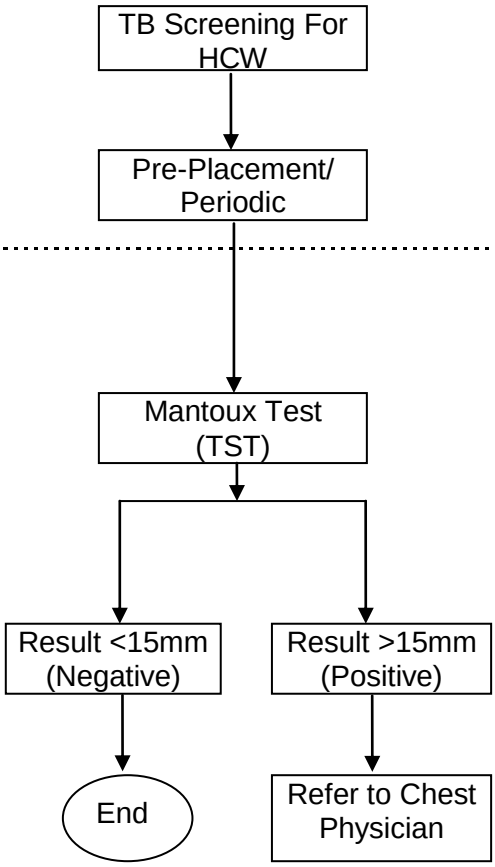
- Tuberculin Skin Test (TST)
- IGRA Test when recommended by Chest Physician
- Chest X-ray (if MOH HCW had been radio graphed in less than six (6) months prior, the chest radiograph may not need to be done. Instead the report of the chest radiograph shall be provided)
- Please refer to **Figure 1**.

7. Management

After the medical examination, the attending Medical Officer shall certify whether the new personnel's are TB positive or TB negative. If the new personnel's are TB positive, they should be managed according to Clinical Practice Guidelines for the Control and Management of Tuberculosis. TB negative personnel's shall be allowed to work in the areas where they are assigned to.

Figure 1: Flow Chart Of HCW TB Screening Process

HEALTHCARE WORKERS TB SCREENING PROCESS IN MINISTRY OF HEALTH,MALAYSIA



Test to be done	1. Symptom Screening 2. Mantoux Test 3. Interferon Gama Release Assay (IGRA) Test : When recommended by chest physician 4. Chest X-Ray: When recommended by physician	
Place	1. Hospital : Chest Clinic 2. Health : PR1 / PR2	
Time Frame	Within 2 weeks after placement (Pre-Placement)	Yearly (Periodic)

3.2 PERIODIC MEDICAL EXAMINATION (Appendix 9 and 10)

Prior to Periodic Medical Examination, Risk Classification of TB Infection for Health Care Settings shall be done by the Safety and Health Committee of the facility. The pulmonary TB surveillance program should be based on the facility risk classification.

Management

TB status shall be certified by the attending Medical Officer. If the staffs are found to be TB positive, the management shall commence as appropriate.

Table 2. Recommendations of TB Screening Frequency for HCWs

Ministry of Health

Screening Methods	FREQUENCY		
	Low Risk	**Medium Risk**	**Potential Ongoing Transmission**
Mantoux test (TST)	Yearly		
Interferon Gama Release Assay (IGRA) Test	When recommended by Chest Physician		
PTB Symptoms Screening	Yearly		
Chest x-ray	When HCWs are symptomatic or recommended by a clinician		

Forms to be used and records keeping

- After the examination, the form shall be maintained and kept in the Chest Clinic.
- The OHU TB-2 forms **(Appendix 11)** shall be used as continuation sheets of Pre-Placement Medical Examination which is done earlier.

- A report shall be submitted to the Occupational and Environmental Health Officer, State Health Department every month by using OHU TB 3b **(Appendix 12)** format. The Occupational and Environmental Health Officers (OEHO) of the states shall coordinate all related activities in the states' facilities, including TB audit and monitoring of TB among Health Care Workers. The State OEHO shall submit a report to the Occupational Health Unit, Disease Control Division, Ministry of Health by using OHU TB 4b **(Appendix 13)** format every six (6) month.
- If the staff is found to be TB positive, notification of diseases shall use PL 206, WEHU L1 (JKKP7) & L2 and TBIS 10A.

3.3 PRE-RETIREMENT / PRE-TRANSFERRED OUT

Pre-Retirement / Pre-Transferred Out Medical Examination shall be done for HCWs who are about to retire or transferred out of the High Risk TB Area (HRTBA). The process workflow shall be similar to Periodic Medical Examination.

Any transfer from one HRTBA to another HRTBA may not require pre-transfer medical examination. Periodic Medical Examination shall commence whenever due.

Any transfer from HRTBA of one facility to another HRTBA in another facility may not require pre-transfer medical examination. However, if the TB status in the previous HRTBA is in doubt, pre-placement medical examination in the new HRTBA facility shall be carried out within two weeks of reporting for duty.

If the staffs are going to be transferred to an unknown TB risk area, the Pre-Retirement / Pre-Transferred Out Medical Examination shall be done accordingly.

Forms to be used and records keeping

- After the examination, the form shall be maintained and kept in the Chest Clinic.
- A report shall be submitted to the Occupational and Environmental Health Officer, State Health Department every month by using OHU TB 3c **(Appendix 14)** format. The Occupational and Environmental Health Officers (OEHO) of the states shall coordinate all related activities in the states' facilities, including TB audit and monitoring of TB among Health Care Workers. The State OEHO shall submit a report to the Occupational Health Unit, Disease Control Division, Ministry of Health by using OHU TB 4c **(Appendix 15)** format every six (6) month.
- If the staff is found to be TB positive, notification of diseases shall use PL 206, WEHU L1 & L2 (JKKP7) and TBIS 10A

3.4. MEDICAL LEAVE

All HCWs confirmed to have active pulmonary TB infection should be given medical leave at least two weeks or until the sputum AFB is negative.

3.5. RETURN TO WORK POLICY

- HCW with TB should be allowed to return to work when a physician has confirmed and document that the HCW is non-infectious.
- Criteria For Return To Work:
  i. Worker receives adequate anti-TB therapy
  ii. Cough has resolved
  iii. Results of three consecutive sputum acid-fast bacilli (AFB) smears negative. (The sputum should be collected 8-24 hours apart, with at least one being an early morning specimen because respiratory secretions pool overnight.)
- After the HCWs resume duty and while they remain on anti-TB therapy, regular (monthly) follow up is needed to ensure that effective drug therapy

is maintained as recommended by the physician and DOT should be practiced.

- If the HCWs discontinue treatment, they need to be evaluated by the Chest Physician/General Physician for the possibility of active TB.

3.5. INVESTIGATION OF TB AMONG HCWs

- The Investigating Team should include but not limited to:-
  - KPAS/OHU Medical Officer/Medical Officer
  - Environment Health Assistant Officer (PPKP)
  - Medical Assistant
- The Investigating Officer has to interview the infected HCW to get the personal information, the occupational history and to inspect the work environment using *Format Penyiasatan Kes Tuberkulosis Di Kalangan Kakitangan Kementerian Kesihatan Malaysia* **(Appendix 16).**
- At the end of the investigation, the State KPAS/OHU Principle Assistant Director would conclude whether it is a case of occupational related TB or not.
- TB cases among Health Care Workers must be notified to the Medical Officer at the nearest District Health Office. Patient database must be recorded in TB Information System (TBIS).

3.6. NOTIFICATION OF OCCUPATIONAL RELATED TB.

- All cases of occupational related TB infection should be notified within 7 days using the WEHU L1/ L2 (JKKP7) forms **(Appendix 17).**
- Notification should be made to State Health Department **(Appendix 18)** which will then send a copy of the notification form to the Department of Occupational Safety and Health (DOSH) and Occupational Health Unit, Ministry of Health.

3.7 RECORD KEEPING

A record of details on each TB cases among the health care workers should be kept by the facilities within which they are working. According to Notification of Accident, Dangerous Occurrence, Occupational Poisoning and Occupational Disease Regulations 2004, the record should be kept for at least 5 years from the date on which it was made. One copy of the record should be sent to the Occupational Health Unit, Ministry of Health through the State's Health Department yearly using the JKKP 8 forms.

CHAPTER 4 – GUIDELINES OF TB INFECTION FOR SPECIAL SETTINGS

GENERAL CONSIDERATION

- Infection-control policies for special healthcare settings should be developed, based on the community TB risk assessment and reviewed regularly. The policies should include:
    - Appropriate screening for latent TB infection and active TB among HCWs.
    - Education and training on the risk for transmission to the HCWs.
    - HCW responsibilities in protecting themselves from contracting TB.
    - Provisions for detection and management of patients who have suspected or confirmed TB disease.
- Notice or signage to be put up at HC setting to remind infectious TB patients to wear mask all the time to reduce transmission to others.
- HCWs who use respiratory protection should be provided with the training on respirator use, care and fit testing.

4.1. OUTPATIENT AND EMERGENCY DEPARTMENTS

- Put up signage to inform patients with chronic cough:-
    - to go to specific / identified counter or staff and
    - use surgical mask provided before proceeding to registration counter.
- Triage – to separate high risk patients (i.e. patients with history of cough for more than 2 weeks).
- Provide N95 respirator for HCW in-charge of triaging.
- When taking a patient's medical history HCWs should routinely document whether the patient has symptoms and signs of TB.
- During clinical assessment, HCW should educate patient with suspected or confirmed infectious TB disease on strict respiratory hygiene and cough etiquette.
- Patient with persistent cough should be provided with surgical mask.

- Specific waiting area or room for isolation of patients with persistent cough should be identified.
- Patients should be seen in a specific consultation room equipped with personal protective equipment (N95).
    - ensure the consultation room has good ventilation
    - performance monitoring and maintenance of ventilation system be done on regular basis.
    - disinfection of the room to be done after each clinic session.
    - patients may be required to wear surgical mask when attending the clinic

4.2. DENTAL CLINIC

- When taking a patient's medical history, dental HCWs should routinely document whether the patient has symptoms or signs of TB disease.
- During clinical assessment and evaluation, a patient with suspected or confirmed TB disease should be instructed to observe strict respiratory hygiene and cough etiquette procedures.
- The patient with suspected or confirmed infectious TB should wear a surgical mask or procedure mask, if possible.
- Non-urgent dental treatment should be postponed, and these patients should be promptly referred to an appropriate medical / respiratory / medical setting for evaluation of possible infectiousness.
- If urgent dental care must be provided for a patient who has suspected or confirmed infectious TB disease, dental care should be provided in a setting that meets the requirements for an AII room (if available). If not, dental HCW should strictly adhere to standard precautions procedure.
- Respiratory protection (N95 disposable respirator) should be used while performing procedures on such patients.

- Infection-control policies for each dental healthcare setting should be developed, based on the community TB risk assessment and the periodically should be reviewed annually, if possible.
- For dental health-care settings that routinely provide care to populations at high risk for TB disease, engineering controls (e.g., portable HEPA units) similar to those used in waiting rooms or clinic areas of health-care settings with a comparable community-risk profile might be beneficial.
- The policies include:
    - Appropriate screening for latent TB infection and TB disease for dental HCWs
    - Education on the risk for transmission to the dental HCWs
    - Provisions for detection and management of patients who have suspected or confirmed TB disease.
- In addition, these patients should be kept in the dental health-care setting no longer than required to arrange a referral

4.3. CHEST CLINIC

- Air cleaning system should be provided for every consultation room, waiting area and counseling room.
- To allocate special day / time for seeing infectious TB patients (new patients and follow-ups).
- During clinical assessment, a patient with suspected or confirmed infectious TB should be instructed to observe strict respiratory hygiene and cough etiquette
- Health education should be given in a special counseling area / room. Health education materials such as audio-visual aid, pamphlets, posters etc can be use to minimize contact between HCW and patients**.**

4.4. SPUTUM INDUCTION AREA / ROOM (BOOTH)

- Sputum induction should be performed in an area or room with local exhaust ventilation (e.g., booths with special ventilation) or alternatively in a room that meets the requirements of an AII room.
- N95 disposable respirator should be worn by HCWs performing sputum inductions on a patient with suspected or confirmed infectious TB disease.
- After sputum induction is performed, allow adequate time to elapse in order to ensure removal of *M. tuberculosis*–contaminated room air before performing another procedure in the same room.
- Patients with suspected or confirmed infectious TB should wear surgical mask after the procedure.

4.5. DIALYSIS UNITS

- Annual screening (medical surveillance) for HCW is indicated if ongoing exposure to *M. tuberculosis* is probable.
- To allocate special area enclosed with local exhaust ventilation or room with best ventilation. If not available, placed patient with infectious TB at the end of the room.
- ESRD patients on dialysis must be screened for active TB annually.
- End Stage Renal Disease (ESRD) patients who need chronic dialysis should have at least one test for *M. tuberculosis* infection to determine the need for treatment of latent TB infection
- Annual re-screening is indicated if ongoing exposure of ESRD patients to *M. tuberculosis* is probable.
- Dialysis staff should use an N95 disposable respirator if there is on-going exposure to End stage renal disease (ESRD) patient with infectious TB.
- Hemodialysis procedures should be performed on hospitalized patients with suspected or confirmed TB disease in an AII room.

- TB patients who need chronic hemodialysis might need referral to a hospital or other setting with the ability to perform dialysis procedures in an AII room until the patient is no longer infectious or another diagnosis is made.

4.6. PHARMACY

- Allocate special code number or counter for TB infectious patients to collect anti-TB drugs or other medications.
- Pharmacist or assistant pharmacist on duty at that counter or counseling room must wear N95 mask when dealing with these patients.
- Provide expedited priority service to TB patients to minimize the length of time spent in the department by identifying the patient through diagnosis or medication in the prescription slips.

4.7. RADIOLOGY DEPARTMENT

- Provide coughing patients with a surgical mask to wear when they go to radiology department.
- Provide expedited priority service to potentially infectious TB patients to minimize the length of time spent in the department.
- Restrict access to the radiology suite during operating hours to patients and essential personnel only (e.g. post signs, enforce the policy)
- Use room with best ventilation system for taking images of potentially infectious TB patients.
- Schedule suspected or confirmed infectious TB patients chest radiographs for non-busy times or less congestion (e.g. at the end of the afternoon).

4.8. INTENSIVE CARE UNITS (ICUs)

- ICUs with a high volume of patients with suspected or confirmed TB disease should have at least one AII room.

- Place ICU patients with suspected or confirmed infectious TB disease in an AII room, if possible.
- Where AII is not available, air cleaning system should be installed in ICU wards.
- To help reduce the risk for contaminating a ventilator or discharging *M. tuberculosis* into the ambient air when mechanically ventilating TB patient, place a bacterial filter on the patient's endotracheal tube (or at the expiratory side of the breathing circuit of a ventilator).
- In selecting a bacterial filter, give preference to models specified by the manufacturer to filter particles 0.3 μm in size in both the unloaded and loaded states with a filter efficiency of >95% at the maximum design flow rates of the ventilator for the service life of the filter, as specified by the manufacturer.

4.9. OPERATING THEATRE

- Postpone non-urgent surgical procedures on TB patients until the patient is determined to be noninfectious.
- Procedures should be scheduled for patients with suspected or confirmed TB disease when a minimum number of HCWs and other patients are present in the surgical suite, and at the end of the day to maximize the time available for removal of airborne contamination.
- The direction of airflow should be away from the operating room to minimize contamination of the surgical field.
- If an OT has an anteroom, the anteroom should be either
    i. positive pressure compared with both the corridor and the OT (with filtered supply air) or
    ii. negative pressure compared with both the corridor and the OT.
- In the usual design in which an OT has no anteroom, keep the doors to the OT closed, and minimize traffic into and out of the room and in the corridor to ensure constant negative pressure.

- Air-cleaning systems can be placed in the room or in surrounding areas to minimize contamination of the surroundings after the procedure.
    - Respiratory protection should be worn by HCWs to protect the sterile field and to protect HCWs from the infectious droplet nuclei generated from the patient. An N95 disposable respirator should be used. Do not use valved or positive-pressure respirators, because they do not protect the sterile field.
    - Post-operative recovery of a patient with suspected or confirmed TB disease should be in an AII room in any location where the patient is recovering.
    - If an AII or comparable room is not available for surgery or postoperative recovery, air-cleaning technologies can be used. However, the infection-control committee should be involved in the selection and placement of these supplemental controls.

4.10. BRONCHOSCOPY SUITE

- **If patient initial sputum AFB is negative, sputum induction should be done before the procedure.**
- Postpone non-urgent procedures on TB patients until the patient is determined to be noninfectious.
- In urgent cases (e.g. massive haemoptysis), bronchoscopist and his/her assistants should wear N95 respirator and face shield for protection.
- Air cleaning system should be installed in the bronchoscopy suite.
- Mechanical ventilation must be operated and maintained efficiently.
- Disinfection of the suite must be done after dealing with every TB patients.
- Cleaning of the bronchoscope should be done in a separate room.
- Sputum collection after bronchoscopy must be done immediately in the suite.

4.11. LABORATORIES

- Personnel who work with *Mycobacterium sp*. specimens should
    - Be trained in methods that minimize the production of aerosols and
    - Undergo periodic competency testing including direct observation of their work practices.
    - Prepare for prompt corrective action following a laboratory accident.
    - Follow good laboratory practice at all time and accept responsibility for correct work performance to assure the safety of fellow workers.
- Tuberculosis culture laboratory must have a well-maintained and properly functioning biological safety cabinet (BSC), with HEPA filter and/or air supply system. There are two types of BSC;
    - Class 1 negative pressure BSC-draws a minimum of 75 linear feet of air per minute (22.86 meter per second) across the front opening and exhaust 100% of air to the outside (protection to the user).
    - Class II vertical laminar flow cabinet – blows HEPA filtered air over the work area (protection to the user and environment).
- All specimens suspected of containing *M. tuberculosis* (including specimens processed for other microorganisms) should be handled in a Class I or II biological safety cabinet (BSC).
- Pre-employment (placement) or baseline CXR and Mantoux test should consider to be done. Strongly positive reactors (>10mm) with symptoms suggestive of tuberculosis should be evaluated clinically and microbiologically.
- Medical surveillance for all laboratory staff should be done annually. More frequent monitoring is recommended in the event of a documented conversion among laboratory staff or a laboratory accident that poses a risk of exposure to *M. tuberculosis* (e.g., malfunction of a centrifuge leading to aerosolization of a sample).

- Standard personal protective equipment should be available and consists of:
    i. Laboratory coats - which should be left in the laboratory before going to non-laboratory areas.
    ii. Disposable gloves - Gloves should be disposed of when work is completed, the gloves are overtly contaminated, or the integrity of the glove is compromised.
    iii. Face protection (e.g., goggles, full-face piece respirator, face shield, or other splatter guard) should also be used when manipulating specimens inside or outside a BSC.
    iv. Respiratory protection (N95) should be worn when performing procedures that can result in aerosolization outside a BSC.
    v. Laboratory workers who use respiratory protection should be trained on respirator use and care, and fit testing.

- Appropriate ventilation should flow from clean to contaminated areas.
    - In peripheral lab, windows should be located in such a way that air currents do not pass over the area of smear preparation in the direction of the laboratory worker preparing the smears.
    - In culture laboratories, air should be continuously extracted to the outside of the laboratory at a rate of six to twelve air changes per hour. Supply and exhaust air devices should be located on opposite wall with supply air provided from clean areas and exhaust air taken from less clean areas.

4.12 SPUTUM INDUCTION AND INHALATION THERAPY ROOMS

- Sputum induction should be performed by using local exhaust ventilation (e.g., booths with special ventilation) or alternatively in a room that meets or exceeds the requirements of an AII room.

- At least an N95 disposable respirator should be worn by HCWs performing sputum inductions or inhalation therapy on a patient with suspected or confirmed infectious TB disease.
- After sputum induction or inhalation therapy is performed on a patient with suspected or confirmed infectious TB disease, allow adequate time to elapse to ensure removal of *M. tuberculosis*–contaminated room air before performing another procedure in the same room.
- Patients with suspected or confirmed TB disease who are undergoing sputum induction or inhalation therapy should be kept in an AII room until coughing subsides.

APPENDIX

Appendix 1

Early identification and diagnosis

- Prompt identification of patients with suspected TB is critical to initiate TB treatment, thus reducing the exposure of HCWs to infectious TB patients.
- Ideally, laboratory staff should be available seven days a week, so that AFB sputum smears can be performed and read in a timely manner, and results can be available within 24 hours of specimen collection.
- Sputum specimen should reach the laboratory in a timely manner.
- The laboratory performing acid-fast bacilli (AFB) smears should be proficient at:
    i. Sputum specimen processing
    ii. Administrative aspects of specimen processing (e.g., record-keeping, immediate notification of positive smears)
    iii. Maintaining quality control of diagnostic procedures (e.g., AFB sputum smears)
    iv. Ensuring adequate supplies of equipment for processing of sputum samples

Appendix 2

2.1 : TB Patient Transfer/Transport Procedure

- Create a plan for accepting patients who have suspected or confirmed TB disease if they are transferred from another setting.
- Patients with suspected or confirmed infectious TB disease who must be transported to another area of the setting or to another setting for a medically essential procedure should bypass the waiting area and wear a surgical mask, if possible.
- Patients who cannot tolerate masks because of medical conditions should observe strict respiratory hygiene and cough etiquette procedures (they must close their nose and mouth when coughing or sneezing).

2.2 : TB Patient Procedure Schedule

- Procedures for TB patients should be scheduled when there are: -
  i. A minimum number of HCWs and other patients present
  ii. As the last procedure of the day, to maximize the time for decontamination procedure
  iii. During hours when the clinic is less congested (e.g., afternoons).

Appendix 3

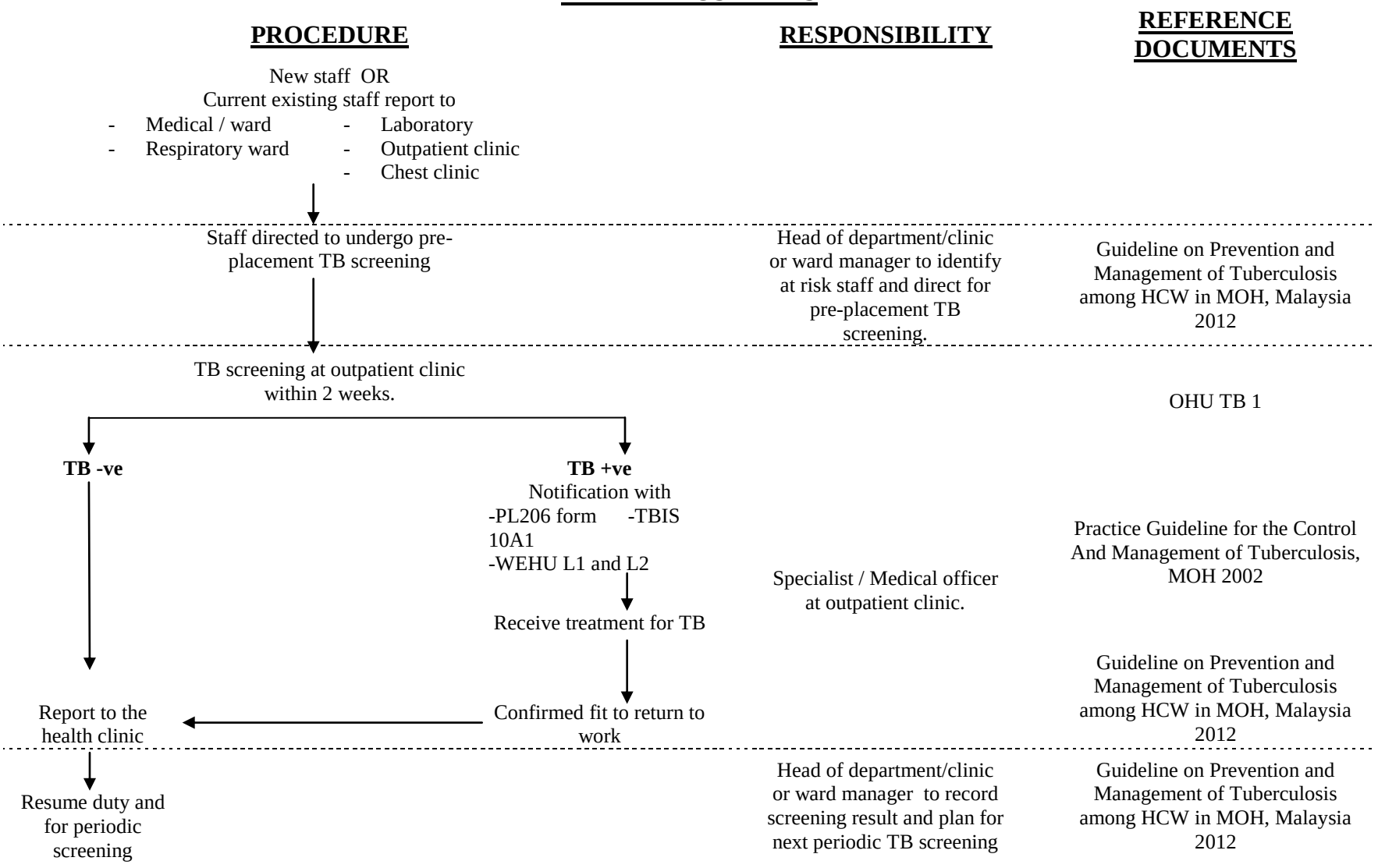
Workplace Risk Assessment for TB

The workplace risk assessment is to determine the risk of TB transmission in the workplace. After the risk level is determine, control measures should be taken to reduce the risk. Subsequently, the risk should be reevaluated to determine whether it needs certain control measures.

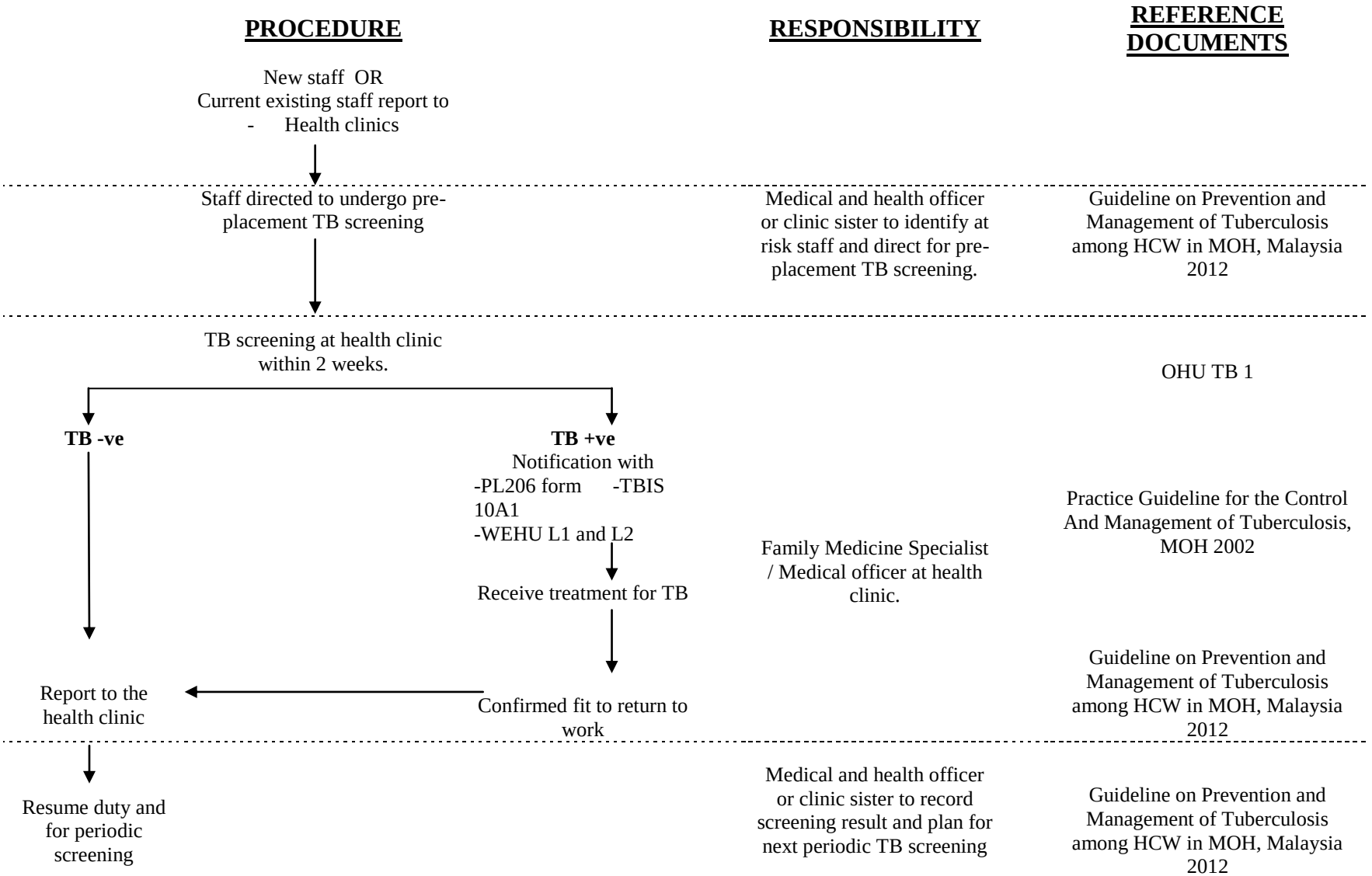
Action	**Responsibility**
Risk Assessment	Hospital/Clinic Employers Hospital Director
	(can be done by hiring consultant)
Control Measures	

Appendix 4

FLOW-CHART FOR PRE-PLACEMENT TB SCREENING FOR HEALTHCARE WORKERS AT THE MINISTRY OF HEALTH HOSPITALS



FLOW-CHART FOR PRE-PLACEMENT TB SCREENING FOR HEALTHCARE WORKERS AT THE MINISTRY OF HEALTH , DISTRICT HEALTH OFFICE



Appendix 6

OHU TB-1

UNIT KESIHATAN PEKERJAAN, KEMENTERIAN KESIHATAN MALAYSIA
OCCUPATIONAL HEALTH UNIT, MINISTRY OF HEALTH MALAYSIA

"Rakan Anda Dalam Meningkatkan Kesihatan Pekerja"
"Your Partner In Enhancing Workers' Health"

FORMAT PEMERIKSAAN KESIHATAN PRA PENEMPATAN ANGGOTA KEMENTERIAN KESIHATAN MALAYSIA

1.0 Data Peribadi Kakitangan

1.1 Nama kakitangan :.....

1.2 No. kad pengenalan: :.....

1.3 Jantina Lelaki ☐ Perempuan ☐

1.4 Bangsa Melayu ☐ Cina ☐ India ☐ Lain-lain ☐

1.5 Alamat tempat tinggal :.....
sekarang .....
.....

1.6. No. telefon :.....

1.7. Jawatan :.....

1.8. Alamat tempat kerja :.....
sekarang .....
.....

2.0 Vaksinasi BCG: Ya/Tidak . Jika ya, nyatakan tarikh.....

3.0 Sejarah penyakit TB: Ya/Tidak. Jika ya, nyatakan tarikh.....

3.1 Hasil rawatan: Sembuh/sempurna rawatan/ terhenti rawatan/ gagal rawatan

4.0 Tanda dan gejala penyakit TB

	YA	TIDAK		YA	TIDAK
Batuk > 2 minggu			Berpeluh malam		
Demam			Sakit dada		
Susut berat badan			Letih lesu		
Kurang selera makan			Lain-lain		

5.0 Ujian

MANTOUX		X-RAY DADA		UJIAN KAHAK				Berat Badan (Kg)
Tarikh	Keputusan (mm)	Tarikh	Keputusan	Tarikh	Keputusan Mikroskopi	Keputusan Kultur	Keputusan Ujian Sensitiviti	

.....

(Tandatangan & Cop Rasmi)

Tarikh:

Nama Doktor :

No. Pendaftaran MMC:

Alamat Tempat Kerja:

No. Telefon:

Appendix 7

OHU TB 3a

LAPORAN BULANAN PEMERIKSAAN PRA-PENEMPATAN PENYAKIT TB BAGI KAKITANGAN KEMENTERIAN KESIHATAN

Hospital / Pejabat Kesihatan Daerah: _____

Bulan : _____ Tahun: _____

Kategori jawatan / Unit/Wad	Pegawai Perubatan		Pegawai Farmasi		Pen. Peg. Farmasi		Jururawat/ Jururawat Masyarakat		Pen. Peg. Perubatan		Pegawai Sains (Kaji kuman)		JTMP		Pemb. Perawatan Kesihatan /Atendan	
	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx
JUMLAH																

Jumlah positif	
Jumlah negatif	
Jumlah kakitangan di periksa	

*Tempat bertugas berisiko untuk saringan pra-penempatan TB	
Hospital:	Wad perubatan, wad respiratori, kliniik dada, makmal, klinik pesakit luar
Klinik kesihatan:	Klinik pesakit luar, makmal

*Pengarah Hospital dan Pegawai Kesihatan Daerah perlu menghantar reten kepada Pegawai KPAS Negeri pada atau sebelum 7 haribulan setiap bulan yang berikutnya.

Nota:
Jumlah positif = jumlah kes disahkan menghidapi TiBi
Jumlah negatif = semua kes yang keputusan mantoux >15mm didapati tidak menghidapi TiBi
Jumlah kakitangan di periksa = jumlah semua kes yang disaring

Appendix 8

OHU TB 4a

LAPORAN SETENGAH TAHUN PEMERIKSAAN PRA-PENEMPATAN PENYAKIT TB BAGI KAKITANGAN KEMENTERIAN KESIHATAN

Negeri: _____

Setengah tahun: Pertama/Kedua Tahun: _____

Fasiliti / Kategori jawatan		Pegawai Perubatan		Pegawai Farmasi		Pen. Peg. Farmasi		Jururawat/ Jururawat Masyarakat		Pen. Peg. Perubatan		Pegawai Sains (Kaji kuman)		JTMP		Pemb. Perawatan Kesihatan /Atendan	
		Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx
HOSPITAL	**Wad medikal**																
	Wad respiratori																
	Klinik dada																
	Makmal																
	Klinik pesakit luar																
	Lain-lain																
	JUMLAH																
Klinik Kesihatan	**Klinik pesakit luar**																
	Makmal																
	Lain-lain																
	JUMLAH																
JUMLAH BESAR																	

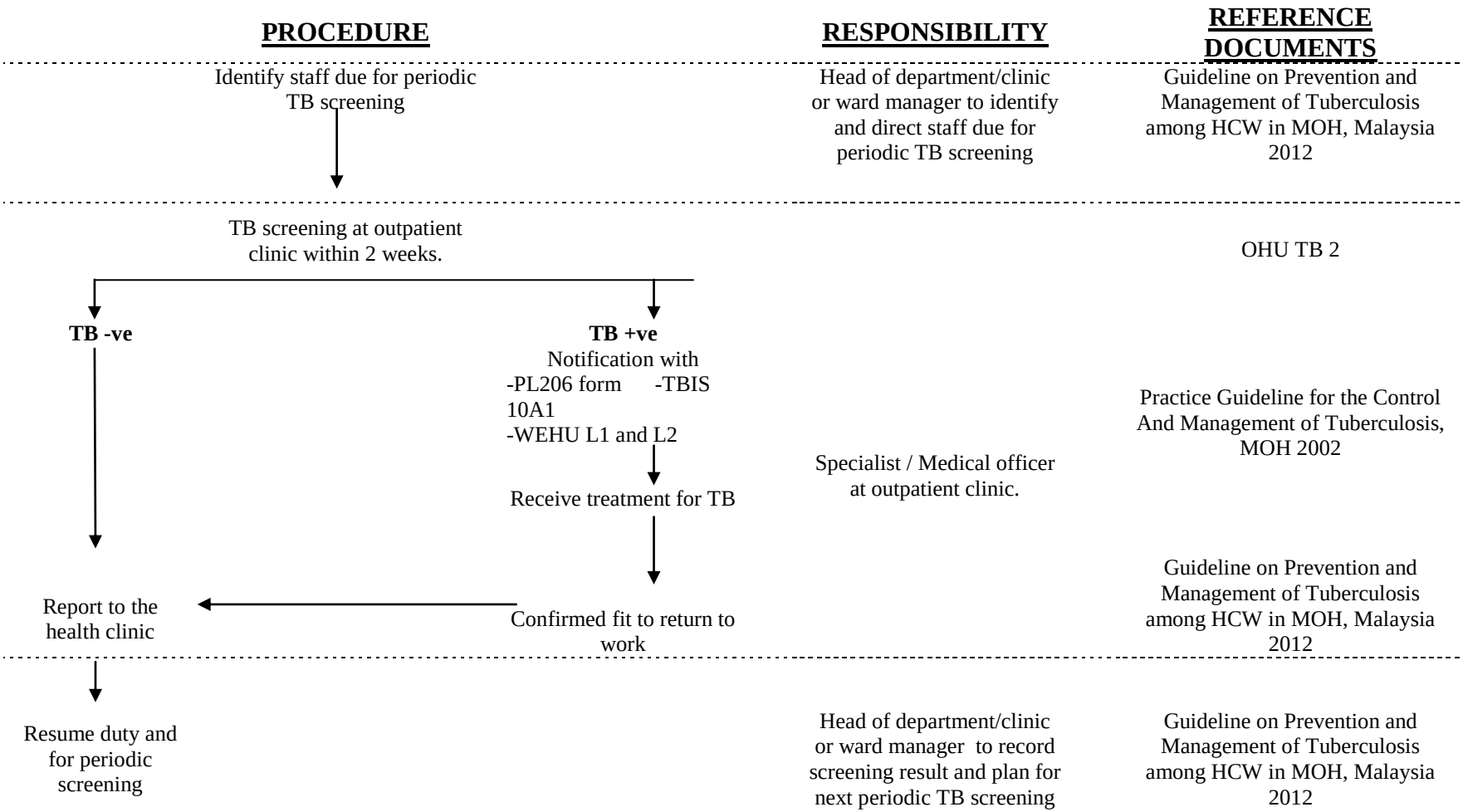
	Hospital	Klinik Kesihatan	JUMLAH
Jumlah positif			
Jumlah negatif			
Jumlah kakitangan di periksa			

* Pegawai KPAS Negeri perlu menghantar reten kepada Ketua Penolong Pengarah, Unit Kesihatan Pekerjaan, Bahagian Kawalan Penyakit pada atau sebelum 14 haribulan setiap 6 bulan

Nota:
Jumlah positif = jumlah kes disahkan menghidapi TiBi
Jumlah negatif = semua kes yang keputusan mantoux >15mm didapati tidak menghidapi TiBi
Jumlah kakitangan di periksa = jumlah semua kes yang disaring

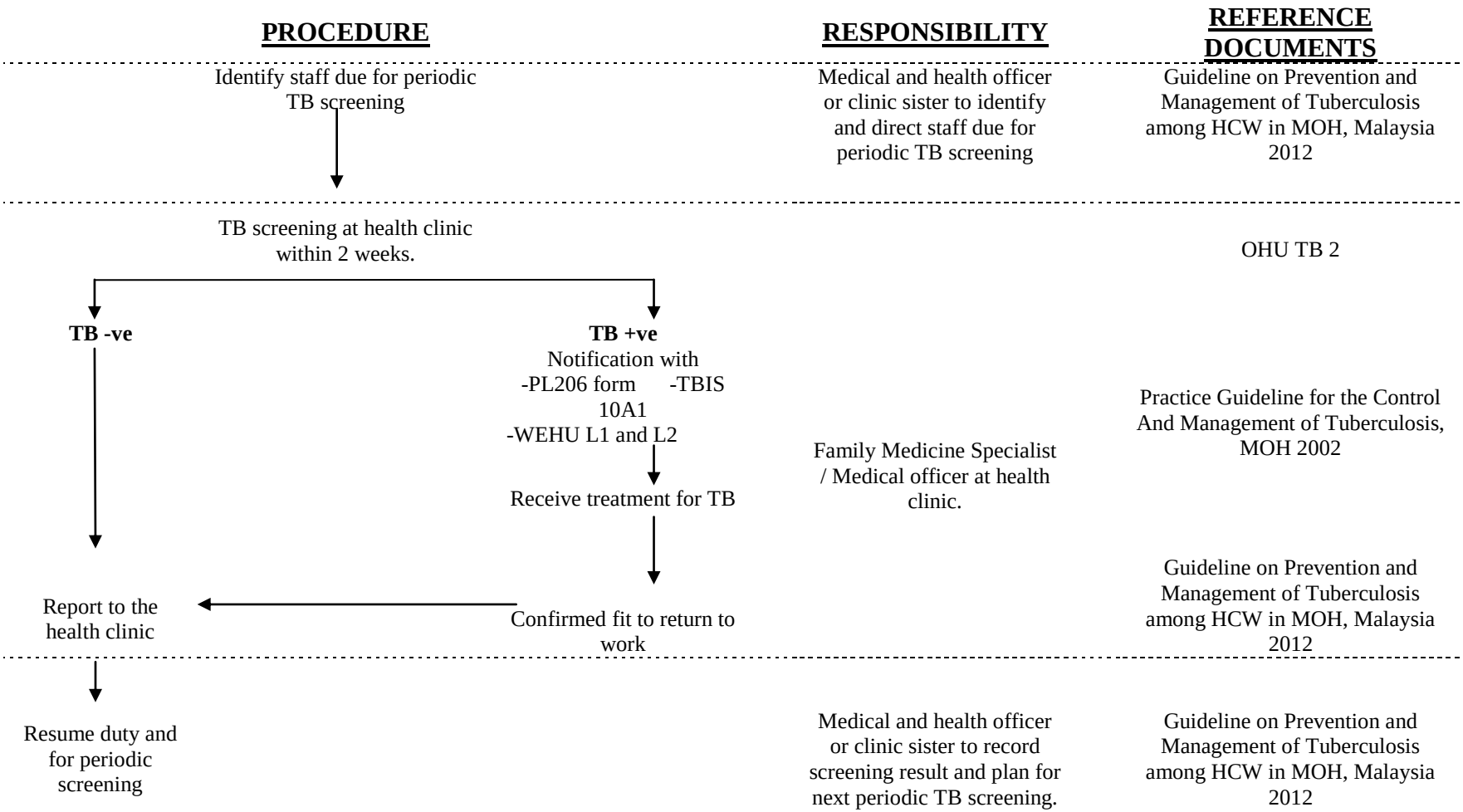
Appendix 9

FLOW-CHART FOR PERIODIC TB SCREENING FOR HEALTHCARE WORKERS AT THE MINISTRY OF HEALTH HOSPITALS



Appendix 10

FLOW-CHART FOR PERIODIC TB SCREENING FOR HEALTHCARE WORKERS AT THE MINISTRY OF HEALTH DISTRICT HEALTH OFFICE



Appendix 11

OHU TB-2 Form

Helaian Pemeriksaan Kesihatan (TB) Berkala (TB Periodic Medical Examination)

SIMPTOM (batuk, hemoptisis, hilang selera makan, hilang berat badan, demam, sesak nafas dsb)		**MANTOUX (TST) / INTERFERON GAMA RELEASE ASSAY (IGRA) TEST**		**X-RAY DADA**		**UJIAN KAHAK**				**Berat Badan (Kg)**	**PENGESAHAN PEGAWAI PERUBATAN**		
Simptom	Tempoh	Tarikh	Keputusan (mm) / qft	Tarikh	Keputusan	Tarikh	Keputusan Mikroskopi	Keputusan Kultur	Keputusan Ujian Sensitiviti		+ / -	Tandatangan dan nama	Tarikh

Appendix 12

OHU TB 3b

LAPORAN BULANAN PEMERIKSAAN BERKALA (PERIODIC SCREENING) PENYAKIT TB BAGI KAKITANGAN KEMENTERIAN KESIHATAN

Hospital / Pejabat Kesihatan Daerah: _____

Bulan : _____ Tahun: _____

Kategori jawatan / Unit/Wad	Pegawai Perubatan		Pegawai Farmasi		Pen. Peg. Farmasi		Jururawat/ Jururawat Masyarakat		Pen. Peg. Perubatan		Pegawai Sains (Kaji kuman)		JTMP		Pemb. Perawatan Kesihatan /Atendan	
	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx
JUMLAH																

Jumlah positif	
Jumlah negatif	
Jumlah kakitangan di periksa	

*Tempat bertugas berisiko untuk saringan pra-penempatan TB	
Hospital:	Wad perubatan, wad respiratori, kliniik dada, makmal, klinik pesakit luar
Klinik kesihatan:	Klinik pesakit luar, makmal

*Pengarah Hospital dan Pegawai Kesihatan Daerah perlu menghantar reten kepada Pegawai KPAS Negeri pada atau sebelum 7 haribulan setiap bulan yang berikutnya.

Nota:
Jumlah positif = jumlah kes disahkan menghidapi TiBi
Jumlah negatif = semua kes yang keputusan mantoux >15mm didapati tidak menghidapi TiBi
Jumlah kakitangan di periksa = jumlah semua kes yang disaring

Appendix 13

OHU TB 4b

LAPORAN SETENGAH TAHUN PEMERIKSAAN BERKALA (PERIODIC SCREENING) PENYAKIT TB BAGI KAKITANGAN KEMENTERIAN KESIHATAN

Negeri: _____

Setengah tahun: Pertama/Kedua Tahun:_____

Fasiliti / Kategori jawatan		Pegawai Perubatan		Pegawai Farmasi		Pen. Peg. Farmasi		Jururawat/ Jururawat Masyarakat		Pen. Peg. Perubatan		Pegawai Sains (Kaji kuman)		JTMP		Pemb. Perawatan Kesihatan /Atendan	
		Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx
HOSPITAL	**Wad medikal**																
	Wad respiratori																
	Klinik dada																
	Makmal																
	Klinik pesakit luar																
	Lain-lain																
	JUMLAH																
Klinik Kesihatan	**Klinik pesakit luar**																
	Makmal																
	Lain-lain																
	JUMLAH																
JUMLAH BESAR																	

	Hospital	Klinik Kesihatan	JUMLAH
Jumlah positif			
Jumlah negatif			
Jumlah kakitangan di periksa			

* Pegawai KPAS Negeri perlu menghantar reten kepada Ketua Penolong Pengarah, Unit Kesihatan Pekerjaan, Bahagian Kawalan Penyakit pada atau sebelum 14 haribulan setiap 6 bulan

Nota:
Jumlah positif = jumlah kes disahkan menghidapi TiBi
Jumlah negatif = semua kes yang keputusan mantoux >15mm didapati tidak menghidapi TiBi
Jumlah kakitangan di periksa = jumlah semua kes yang disaring

Appendix 14

OHU TB 3c

LAPORAN BULANAN PEMERIKSAAN PRA PERSARAAN / PRA PERPINDAHAN (PRE RETIREMENT / PRE TRANSFER) PENYAKIT TB BAGI KAKITANGAN KEMENTERIAN KESIHATAN

Hospital / Pejabat Kesihatan Daerah: _____

Bulan : _____ Tahun: _____

Kategori jawatan / Unit/Wad	Pegawai Perubatan		Pegawai Farmasi		Pen. Peg. Farmasi		Jururawat/ Jururawat Masyarakat		Pen. Peg. Perubatan		Pegawai Sains (Kaji kuman)		JTMP		Pemb. Perawatan Kesihatan /Atendan	
	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx
JUMLAH																

Jumlah positif	
Jumlah negatif	
Jumlah kakitangan di periksa	

*Tempat bertugas berisiko untuk saringan pra-penempatan TB	
Hospital:	Wad perubatan, wad respiratori, kliniik dada, makmal, klinik pesakit luar
Klinik kesihatan:	Klinik pesakit luar, makmal

*Pengarah Hospital dan Pegawai Kesihatan Daerah perlu menghantar reten kepada Pegawai KPAS Negeri pada atau sebelum 7 haribulan setiap bulan yang berikutnya.

Nota:
Jumlah positif = jumlah kes disahkan menghidapi TiBi
Jumlah negatif = semua kes yang keputusan mantoux >15mm didapati tidak menghidapi TiBi
Jumlah kakitangan di periksa = jumlah semua kes yang disaring

Appendix 15

OHU TB 4c

LAPORAN SETENGAH TAHUN PEMERIKSAAN PRA PERSARAAN / PRA PERPINDAHAN (PRE RETIREMENT / PRE TRANSFER) PENYAKIT TB BAGI KAKITANGAN KEMENTERIAN KESIHATAN

Negeri: _____

Setengah tahun: Pertama/Kedua/Ketiga/Keempat Tahun:_____

Fasiliti / Kategori jawatan		Pegawai Perubatan		Pegawai Farmasi		Pen. Peg. Farmasi		Jururawat/ Jururawat Masyarakat		Pen. Peg. Perubatan		Pegawai Sains (Kaji kuman)		JTMP		Pemb. Perawatan Kesihatan /Atendan	
		Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx	Bil +ve	Bil Rx
HOSPITAL	**Wad medikal**																
	Wad respiratori																
	Klinik dada																
	Makmal																
	Klinik pesakit luar																
	Lain-lain																
	JUMLAH																
Klinik Kesihatan	**Klinik pesakit luar**																
	Makmal																
	Lain-lain																
	JUMLAH																
JUMLAH BESAR																	

	Hospital	Klinik Kesihatan	JUMLAH
Jumlah positif			
Jumlah negatif			
Jumlah kakitangan di periksa			

* Pegawai KPAS Negeri perlu menghantar reten kepada Ketua Penolong Pengarah, Unit Kesihatan Pekerjaan, Bahagian Kawalan Penyakit pada atau sebelum 14 haribulan setiap 6 bulan

Nota:
Jumlah positif = jumlah kes disahkan menghidapi TiBi
Jumlah negatif = semua kes yang keputusan mantoux >15mm didapati tidak menghidapi TiBi
Jumlah kakitangan di periksa = jumlah semua kes yang disaring

Appendix 16

Format Borang Penyiasatan

UNIT KESIHATAN PEKERJAAN, KEMENTERIAN KESIHATAN MALAYSIA
OCCUPATIONAL HEALTH UNIT, MINISTRY OF HEALTH MALAYSIA

"Rakan Anda Dalam Meningkatkan Kesihatan Pekerja"
"Your Partner In Enhancing Workers' Health"

FORMAT PENYIASATAN KES TUBERKULOSIS ANGGOTA KEMENTERIAN KESIHATAN MALAYSIA

1.0 Data Peribadi Kakitangan

1.1 Nama kakitangan :.....

1.2 No. kad pengenalan: :.....

1.3 Jantina Lelaki ☐ Perempuan ☐

1.4 Bangsa Melayu ☐ Cina ☐ India ☐ Lain ☐

1.5 Alamat tempat tinggal sekarang : .....
.....
.....

1.6. No. telefon : .....

1.7. Jawatan : .....

1.9. Alamat tempat kerja sekarang : .....
.....

1.9. Sekiranya kes diberikan cuti rehat (MC), nyatakan berapa hari : .....

2.0 Maklumat Penyakit dan Rawatan

2.1. Tarikh diagnosis : ☐☐ / ☐☐ / ☐☐

DD / MM / Y Y

2.2 a. Tarikh permulaan gejala-gejala penyakit Tuberkulosis (TB) : ☐☐ / ☐☐ / ☐☐

DD / MM / YY

b. No. Daftar Tibi: (rujuk TBIS10A4)

No. Daftar Tibi	☐☐	☐☐	-	☐☐	☐☐	-	☐☐
	Kod Negeri	*Kaw./Bhg.*	*Daerah*	*Nombor siri*			*Tahun*

2.3 Senarai tempat kerja pesakit (termasuk lawatan ke tempat berisiko jangkitan) dalam tempoh 3 bulan sebelum timbul gejala-gejala penyakit TB

Bulan/Tahun	Tempat Kerja (Fasiliti/Wad/Klinik)

2.4 Jenis TB :

☐ TB Pulmonari, smear positif

☐ TB Pulmonari, smear negatif

☐ TB Extrapulmonari

DD / MM / YY

2.5 Tarikh mula rawatan

DD / MM / Y Y

2.6 Nama Fasiliti yang memulakan rawatan : .....

Sekiranya kakitangan kesihatan dimasukkan ke wad,

2.7 Nama Wad/ Hospital :……

2.8 Tarikh keluar Wad

(Jika berkenaan)

DD / MM / Y Y

2.9 Keputusan ujian pengesahan

Ujian	Tarikh Ujian	Keputusan
1. Sapuan terus kahak AFB		
2. X-ray Dada		
3. Kultur & Sensitiviti Kahak		
4. Ujian Mantoux		
5. HIV		
6. Lain-lain (Nyatakan)		

3.0. Sejarah Pendedahan

3.1 Pernahkan anggota terdedah kepada individu yang disahkan menghidap TB? :

☐ Ya ☐ Tiada ☐ Tidak pasti

3.1.1 Jika Ya, nyatakan hubungan dengan penghidap TB

☐ Ahli Keluarga
☐ Rakan sekerja
☐ Pesakit TB
☐ Lain-lain: Nyatakan _____

Jika ya, nyatakan tempoh pendedahan ☐ < 1 tahun
☐ 1 tahun atau lebih

3.2 Jika ya, dimanakah pendedahan berlaku? ☐ Tempat kerja _____
(Nyatakan: Wad,makmal,Klinik Dada dll)

☐ Di luar tempat kerja
☐ Tidak pasti

3.3 Sejarah Penyakit dan Status Kesihatan Pra Diagnosa Tibi (rujuk TBIS 10A1 Bhg. E), nyatakan jika ada:

.....

.....

.....

4.0 Penyiasatan Tempat Kerja

4.1. Nama dan alamat tempat kerja :.....
kes yang disiasat .....
.....

4.2. Pegawai Perantaraan yg ditemui : .....
(Nama dan Jawatan)

4.3. No. telefon Pegawai Perantaraan : .....

A. Kawalan Pengurusan Tempat Kerja
(Sila tandakan [/] di petak yang berkenaan)

Perkara	Ya	Tidak	Catatan
1) Terdapat Prosedur Kerja Selamat (Safe Operating Procedure) bagi aktiviti-aktiviti berikut :			Prosedur perlu mudah diakses atau dipamerkan
i. Pemeriksaan dan rawatan pesakit TB			
ii. Pengambilan dan pengendalian sampel kahak di klinik/wad			
iii. Pengendalian sampel kahak di makmal			
iv. Lain-lain prosedur (nyatakan)			
2a) Adakah program saringan TB untuk kakitangan baru (pre-placement assessment) dijalankan			
2b) Jenis ujian saringan yang dijalankan:			
i. Ujian Mantoux			
ii. X-ray Dada			
iii. Sapuan terus kahak AFB x 3			
3. Surveilans perubatan untuk penyakit TB			Sila nyatakan kekerapan ujian dijalankan
i. Ujian Mantoux			
ii. X-ray Dada			
iii. Sapuan terus kahak AFB x 3			
4. Latihan dan pendidikan di tempat kerja berkaitan penyakit TB (Nyatakan)			Sila nyatakan tarikh terakhir kursus dijalankan

B. Kawalan Persekitaran Tempat Kerja

Jabatan/Unit yang diperiksa : _____ **Tarikh pemeriksaan :** _____

Jenis Kawalan			Maintenance		'Performance Monitoring'		Catatan*
	Ada	Tiada	Ada (tarikh)	Tiada	Ada (tarikh)	Tiada	
1. Pengudaraan semulajadi i. Tingkap terbuka							
ii. Bukaan tetap							
2. Pengudaraan mekanikal i. 'Blower'							
ii. 'Exhaust fan'							
3. Penapis HEPA i. Bilik / Kawasan							
ii. Bilik / Kawasan							
4. **UVGI** i. Bilik / Kawasan							
ii. Bilik / Kawasan							

Jenis Kawalan			Maintenance		'Performance Monitoring'		Catatan*
	Ada	Tiada	Ada (tarikh)	Tiada	Ada (tarikh)	Tiada	
5. Pengujian							
i Tekanan Udara							
ii Particle Count							
iii Bacteria Count							

*Garispanduan mengisi ruang catatan, sila beri ulasan mengenai perkara-perkara berikut:

i. Kesesuaian kawalan yang sedia ada
ii. Aspek pemantauan sistem kawalan (adakah mencukupi?)
iii. Cadangan pembaikan yang diperlukan

5.0 Penggunaan Alat Pelindung Diri (PPE)

5.1 Alat pelindung pernafasan dibekalkan :

☐ Ya ☐ Tidak

5.2 Jenis peralatan yang dibekalkan

Jenis	Tugasan/Prosedur yang dijalankan	Sesuai	Tidak sesuai
Surgical masks			
N95 respirators			
Powered air purifying respirator (PAPR)			
Lain-lain (Nyatakan)			

5.3 Kekerapan penggunaan alat perlindungan pernafasan semasa mengendalikan pesakit TB

☐ Sentiasa ☐ Kadang-kadang ☐ Tidak pernah

5.4 Stok Simpanan PPE ☐ Ada ☐ Tiada

5.5 Pemberian latihan dan maklumat berkenaan alat perlindungan

5.5.1 Pemilihan Alat Perlindungan Pernafasan ☐ Ada ☐ Tiada

5.5.2 “Fit Test” ☐ Ada ☐ Tiada

5.5.3 Penggunaan ☐ Ada ☐ Tiada

5.5.4 Penyimpanan ☐ Ada ☐ Tiada

5.5.5 Pelupusan ☐ Ada ☐ Tiada

6.0 Rumusan Siasatan

Berdasarkan penyiasatan, adakah pegawai penyiasat berpendapat bahawa faktor-faktor tempat kerja menyumbang kepada penyakit TB pada anggota kesihatan tersebut?

☐ Ya ☐ Tidak

Sila beri ulasan:……..……

……

……

……

……

.....

.....

.....

7.0 Maklumat Pegawai Penyiasat

7.1 Nama Pegawai Penyiasat :…….

7.2 Tarikh Siasatan dimulakan

DD / MM / YY

7.3 Tarikh siasatan berakhir

D D / M M / Y Y

7.4 Tandatangan dan cop Jawatan Pegawai Penyiasat : …….

8.0 Ulasan Pegawai Atasan

8.1 Ulasan Ketua Unit/PPKP Kanan/PPP Kanan (Penyelia kepada Pegawai Penyiasat)

Nama & Jawatan

Tarikh

8.2 Ulasan Ketua Jabatan (Pengarah Hospital/Pegawai Kesihatan Daerah)

Nama & Jawatan

Tarikh

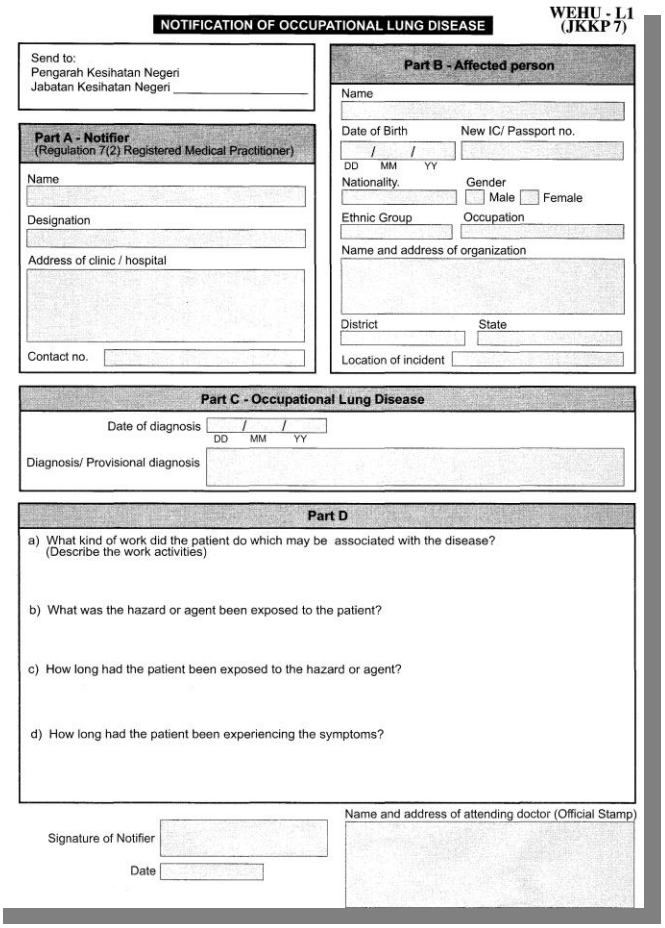
9.0 Ulasan Pegawai KPAS Negeri

Nama & Jawatan

Tarikh

Apendix 17

BORANG WEHU L1 & L2 (JKKP 7)



WEHU - L1
(JKKP 7)

NOTIFICATION OF OCCUPATIONAL LUNG DISEASE

Send to:
Pengarah Kesihatan Negeri
Jabatan Kesihatan Negeri _____

Part A - Notifier
(Regulation 7(2) Registered Medical Practitioner)

Name

Designation

Address of clinic / hospital

Contact no.

Part B - Affected person

Name

Date of Birth / / (DD MM YY)

New IC/ Passport no.

Nationality.

Gender ☐ Male ☐ Female

Ethnic Group

Occupation

Name and address of organization

District

State

Location of incident

Part C - Occupational Lung Disease

Date of diagnosis / / (DD MM YY)

Diagnosis/ Provisional diagnosis

Part D

a) What kind of work did the patient do which may be associated with the disease? (Describe the work activities)

b) What was the hazard or agent been exposed to the patient?

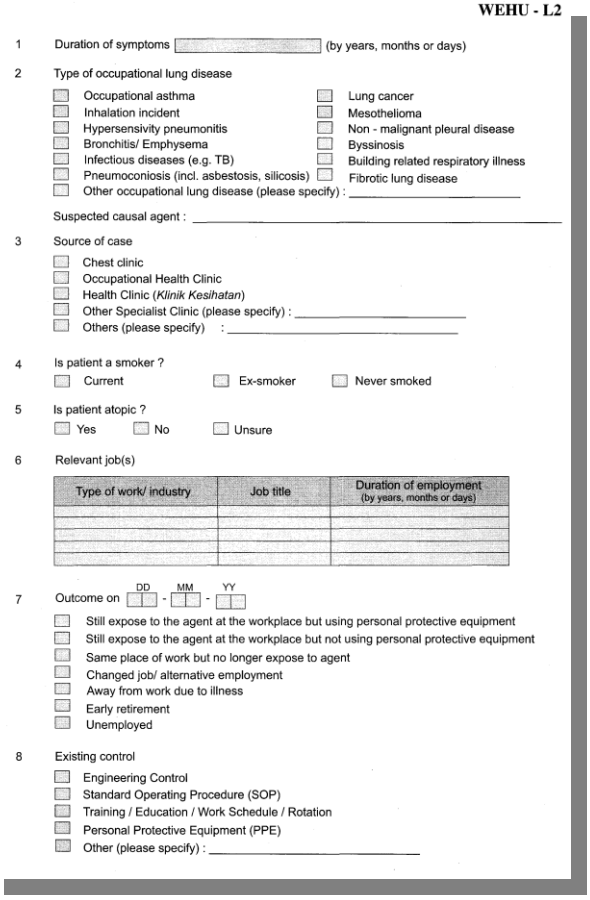
c) How long had the patient been exposed to the hazard or agent?

d) How long had the patient been experiencing the symptoms?

Signature of Notifier

Date

Name and address of attending doctor (Official Stamp)



WEHU - L2

1 Duration of symptoms _____ (by years, months or days)

2 Type of occupational lung disease

- ☐ Occupational asthma
- ☐ Inhalation incident
- ☐ Hypersensivity pneumonitis
- ☐ Bronchitis/ Emphysema
- ☐ Infectious diseases (e.g. TB)
- ☐ Pneumoconiosis (incl. asbestosis, silicosis)
- ☐ Lung cancer
- ☐ Mesothelioma
- ☐ Non - malignant pleural disease
- ☐ Byssinosis
- ☐ Building related respiratory illness
- ☐ Fibrotic lung disease
- ☐ Other occupational lung disease (please specify) : _____

Suspected causal agent : _____

3 Source of case

- ☐ Chest clinic
- ☐ Occupational Health Clinic
- ☐ Health Clinic (*Klinik Kesihatan*)
- ☐ Other Specialist Clinic (please specify) : _____
- ☐ Others (please specify) : _____

4 Is patient a smoker ?

☐ Current ☐ Ex-smoker ☐ Never smoked

5 Is patient atopic ?

☐ Yes ☐ No ☐ Unsure

6 Relevant job(s)

Type of work/ industry	Job title	Duration of employment (by years, months or days)

7 Outcome on DD - MM - YY

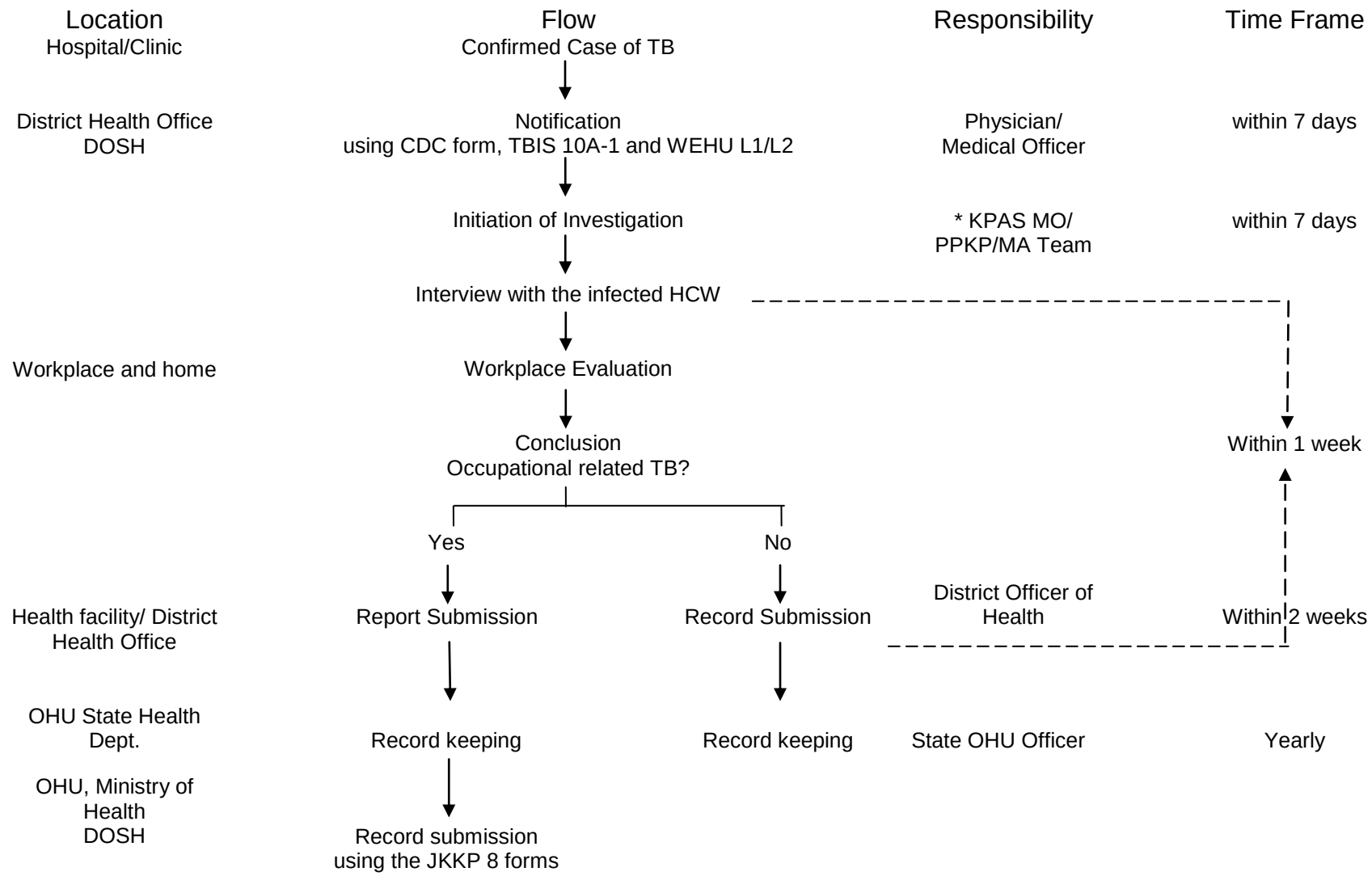
- ☐ Still expose to the agent at the workplace but using personal protective equipment
- ☐ Still expose to the agent at the workplace but not using personal protective equipment
- ☐ Same place of work but no longer expose to agent
- ☐ Changed job/ alternative employment
- ☐ Away from work due to illness
- ☐ Early retirement
- ☐ Unemployed

8 Existing control

- ☐ Engineering Control
- ☐ Standard Operating Procedure (SOP)
- ☐ Training / Education / Work Schedule / Rotation
- ☐ Personal Protective Equipment (PPE)
- ☐ Other (please specify) : _____

Appendix 18

Flow Process of Notification and Reporting of TB Cases Among Health Care Workers



*Team under supervision of KPAS officer. Consists of, but not limited to, KPAS officer, MO trained in OH, OH Nurse, PPKP and