GUIDELINE ON MIDDLE EAST RESPIRATORY SYNDROME (MERS) MANAGEMENT IN MALAYSIA

MINISTRY OF HEALTH MALAYSIA

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MIDDLE EAST RESPIRATORY SYNDROME (MERS)

1.0 INTRODUCTION

1.1 Global Overview of MERS

Middle East respiratory syndrome (MERS) is an illness that affects respiratory system. It is caused by a common type of virus called coronavirus. It has been mostly found in countries in the Middle East, such as Saudi Arabia, Jordan, and Yemen.

Middle East respiratory syndrome coronavirus (MERS-CoV) is a virus transferred to humans from infected dromedary camels. It is a zoonotic virus, meaning it is transmitted between animals and people, and it is contractable through direct or indirect contact with infected animals. MERS-CoV has been identified in dromedaries in several countries in the Middle East, Africa and South Asia. MERS was first reported in 2012. In total, 27 countries have reported cases since 2012 until May 2023, leading to 858 known deaths due to the infection and related complications.

The origins of the virus are not fully understood but according to the analysis of different virus genomes it is believed that it may have originated in bats and later transmitted to camels at some point in the distant past. Human-to-human transmission is possible, but only a few such transmissions have been found among family members living in the same household. In health care settings, however, human-to-human transmission appears to be more frequent.

The clinical spectrum of MERS-CoV infection ranges from no symptoms (asymptomatic) or mild respiratory symptoms to severe acute respiratory disease and death. A typical presentation of MERS is fever, cough and shortness of breath. Pneumonia is a common finding, but MERS patients may not always develop this condition. Gastrointestinal symptoms, including diarrhoea, have also been reported. Severe illness can cause respiratory failure that requires mechanical ventilation or support in an intensive care unit. Older people, people with weakened immune systems, and those with chronic diseases such as renal disease, cancer, chronic lung disease, hypertension, cardiovascular disease and diabetes appear to be at greater risk of developing severe disease.

Approximately 35% of cases reported to WHO have died, but this may be an overestimate of the true mortality rate, as mild cases of MERS may be missed by existing surveillance systems.

No vaccine or specific treatment are currently available, however several MERS-CoV specific vaccines and treatments are in clinical development. In the absence of MERS-specific therapeutics, treatment of MERS patients is supportive and based on the patient's clinical condition.

As a general precaution, anyone visiting farms, markets, barns, or other places where dromedary camels and other animals are present should practice general hygiene measures, including regular hand washing before and after touching animals, and should avoid contact with sick animals.

1.2 Middle East Respiratory Syndrome Coronavirus (MERS-CoV) In Malaysia

In Malaysia, there are 2 cases of laboratory-confirmed case of MERS-CoV until May 2023 reported. On 14 April 2014, the first case of MERS-CoV infection was reported in a man in his mid-fifties, who developed pneumonia with respiratory distress, after returning from a pilgrimage to Saudi Arabia. The case succumbed to his illness three days after admission at a local hospital. The follow-up of 199 close contacts identified through contact tracing and vigilant surveillance did not result in detecting any other confirmed cases of MERS-CoV infection.

The second case of laboratory-confirmed MERS-CoV in Malaysia was on 30th of December 2017. A 55-year-old Malay gentleman with history of performing umrah pilgrimage was tested positive for MERS-CoV on 31st December 2017. He was discharged well after 11 days of admission. Active case detection was conducted. Of the 70 close contacts identified, 36 (51%) were from the same pilgrimage, 20 (29%) were healthcare professionals, 8 (11%) were other close airline contacts and 6 (9%) were household contacts. Throat swabs were taken on 58 contacts, and all were tested negative for MERS-CoV. All contacts were put on Home Surveillance for 14 days and all of them were well. Until now, Malaysia still continues with MERS-CoV surveillance among pilgrim or person coming from suspected areas of MERS.

1.2 Public Health Response In Malaysia

The Ministry of Health has taken the following prevention and control measures:

1) Identification of all contacts of the laboratory confirmed case. Symptomatic contacts who need admission are placed in isolation in hospital and tested for MERS-CoV by RT-PCR. Asymptomatic contacts will be placed under home isolation and monitored for 14 days following last contact with the laboratory confirmed case.
2) Further strengthening of surveillance of 'Influenza-like Illness' (ILI) and 'Severe Acute Respiratory Infection' (SARI) throughout Malaysia, particularly among returning pilgrims from Kingdom of Saudi Arabia (KSA).
3) Intensifying alertness and case management of patients under investigation for MERS-CoV in all health facilities.
4) Enhancement of infection prevention and control measures at all health care facilities.
5) Update MERS guideline accordingly.
6) Reinforcement to the Ministry of Tourism, Department of Islamic Development Malaysia and Malaysian Hajj Pilgrims Fund Board on advice to tour agencies offering Hajj packages to take necessary precautions to prevent pilgrims from being exposed to MERS-CoV while travelling to the Middle East.

MIDDLE EAST RESPIRATORY SYNDROME (MERS) CASE DEFINITION

SUSPECTED CASE – Three (3) Options, a through c

a) A person with an acute respiratory infection, with history of fever and cough and indications of pulmonary parenchymal disease (e.g. pneumonia or ARDS), based on clinical or radiological evidence, and who has travelled within 14 days before onset of illness to the Middle East or countries where MERS-CoV is known to be circulating in dromedary camels or where human infections have recently occurred.

b) Individuals with acute respiratory illness of any degree of severity who within 14 days before onset of illness had any of the following exposures:

   i. close physical contact[1] with a confirmed or probable case of MERS infection, while that patient was ill; **or**

   ii. visiting / staying in a healthcare facility, where hospital associated MERS-CoV outbreak have been reported; **or**

   iii. direct contact with dromedary camels or consumption or exposure to dromedary camel products (raw meat, unpasteurized milk, urine) in countries where MERS is known to be circulating in dromedary camel populations or where human infections occurred as a result of presumed zoonotic transmission.

c) A person with an acute respiratory infection, with history of fever and cough and indications of pulmonary parenchymal disease (e.g. pneumonia or ARDS), based on clinical or radiological evidence, who requires admission to hospital, with no other aetiology that fully explains the clinical presentation[2] and he / she is part of a cluster[3] of severe acute respiratory illness (e.g. fever, and pneumonia) of unknown etiology in which MERS is being evaluated, in consultation with state and local health departments in Malaysia.

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[1] Close physical contact is defined as:

- *Health care associated exposure without the use of recommended PPE, including providing direct care for MERS-CoV patients, working with health care workers infected with MERS-CoV, visiting patients or staying in the same close environment of a MERS-CoV patient.*
- *Working together in close proximity or sharing the same classroom environment with a MERS-CoV patient;*
- *Traveling together with MERS-CoV patient in any kind of conveyance;*
- *Living in the same household as a MERS-CoV patient.*

[2] Clinicians should be alert to the possibility of atypical presentations in patients who are immunocompromised.

[3] A cluster is defined as two or more persons with onset of symptoms within the same 14 day period and who are associated with a specific setting, such as a classroom, workplace, household, extended family, hospital, other residential institution, military barracks or recreational camp.

PROBABLE CASE – Three (3) options, Definition 1 through Definition 3

Definition 1:

- A febrile acute respiratory illness with clinical, radiological, or histopathological evidence of pulmonary parenchymal disease (e.g. pneumonia or Acute Respiratory Distress Syndrome-ARDS); **and**

- Testing for MERS-CoV is unavailable or negative on an inadequate specimen or inconclusive[4]; **and**

- Direct epidemiologic-link[5]; with a confirmed MERS-CoV case.

Definition 2:

- A febrile acute respiratory illness with clinical, radiological, or histopathological evidence of pulmonary parenchymal disease (e.g. pneumonia or ARDS) that cannot be explained fully by any other aetiology; **and**

- Testing for MERS-CoV is inconclusive[4]; **and**

- The person resides or travelled within 14 days before onset of illness to the Middle East or countries where MERS-CoV is known to be circulating in dromedary camels or where human infections have recently occurred.

Definition 3:

- A febrile acute respiratory illness of any severity; **and**

- Testing for MERS-CoV is inconclusive[4]; **and**

- Direct epidemiologic-link[5]; with a confirmed MERS-CoV case.

CONFIRMED CASE

A person with laboratory confirmation of MERS-CoV infection, irrespective of clinical signs and symptoms.

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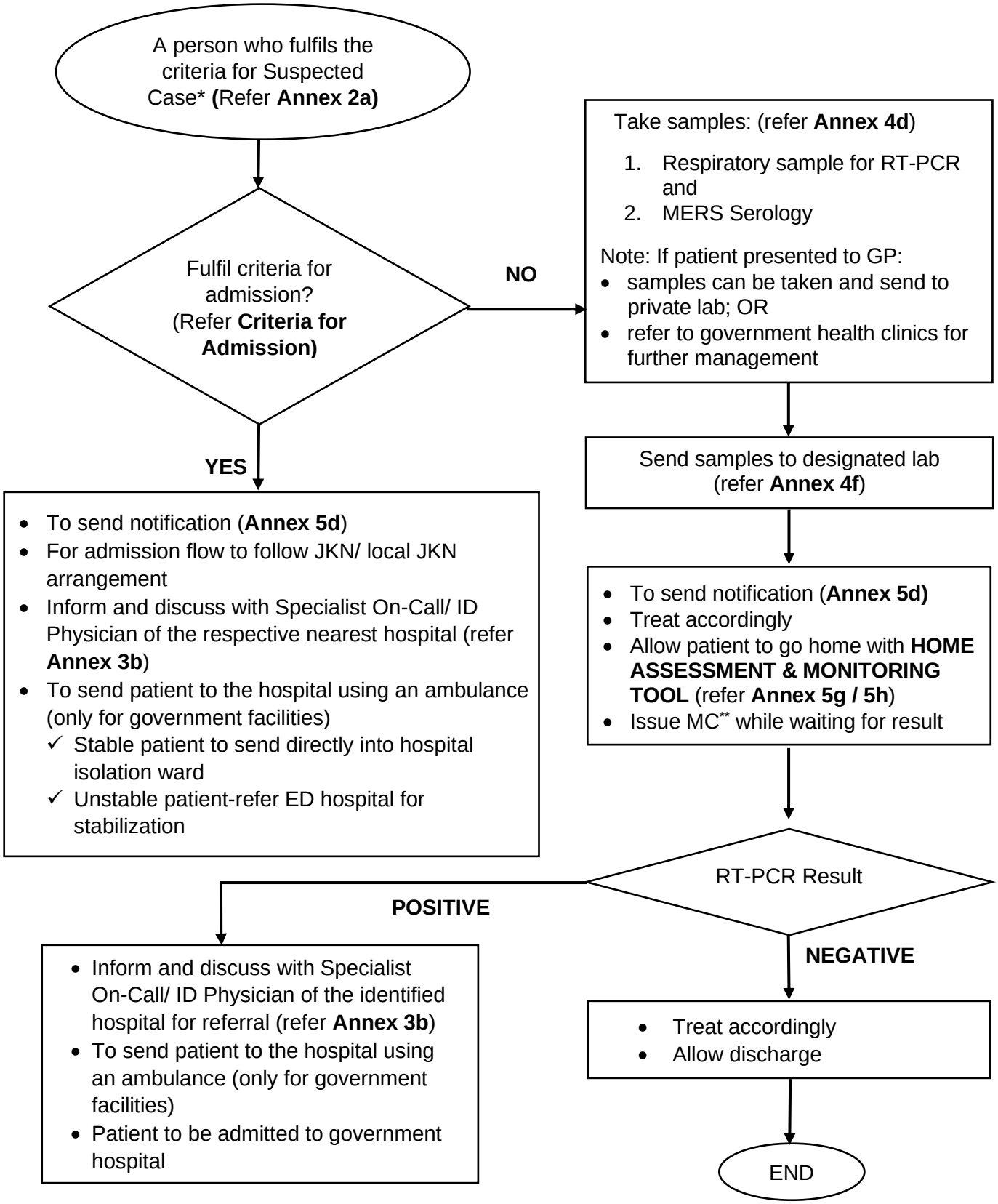
[4] *Inconclusive tests may include:*

- *A positive test by nucleic acid amplification assay for a single target without further testing.*
- *Evidence of sero-reactivity by a single convalescent serum sample ideally taken at least 14 days after exposure by a screening assay (ELISA or IFA) and a neutralization assay, in the absence of molecular confirmation from respiratory specimens.*

[5] *Direct epidemiological link may include:*

- *Close physical contact*
- *Working together in close proximity or sharing the same classroom environment*
- *Travelling together in any kind of conveyance*
- *Living in the same household*

Flow Chart for Management of Suspected Case of MERS as Outpatient in Primary Care Settings and General Practitioners (GP)



NOTE:
*For management of close contact to a confirmed case of MERS, please refer **Annex 5b.**
**The duration of MC will be based on the stipulated time frame of sample delivery and processing.

Criteria for Admission

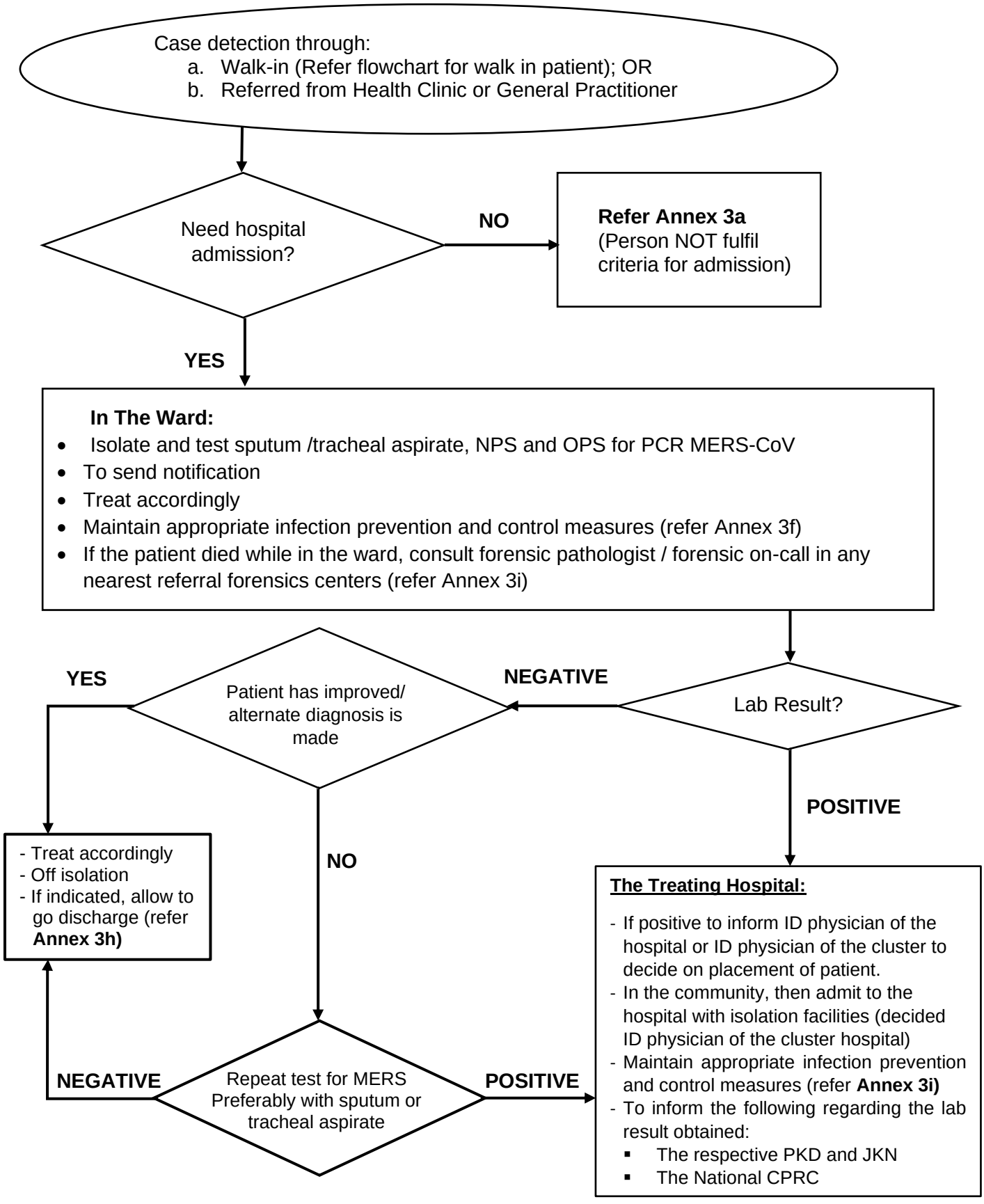
1. Not all suspects of MERS require admission.

2. Viral loads of confirmed MERS patients are at their highest (most infective) in those with severe illness, usually during the second week of the disease.

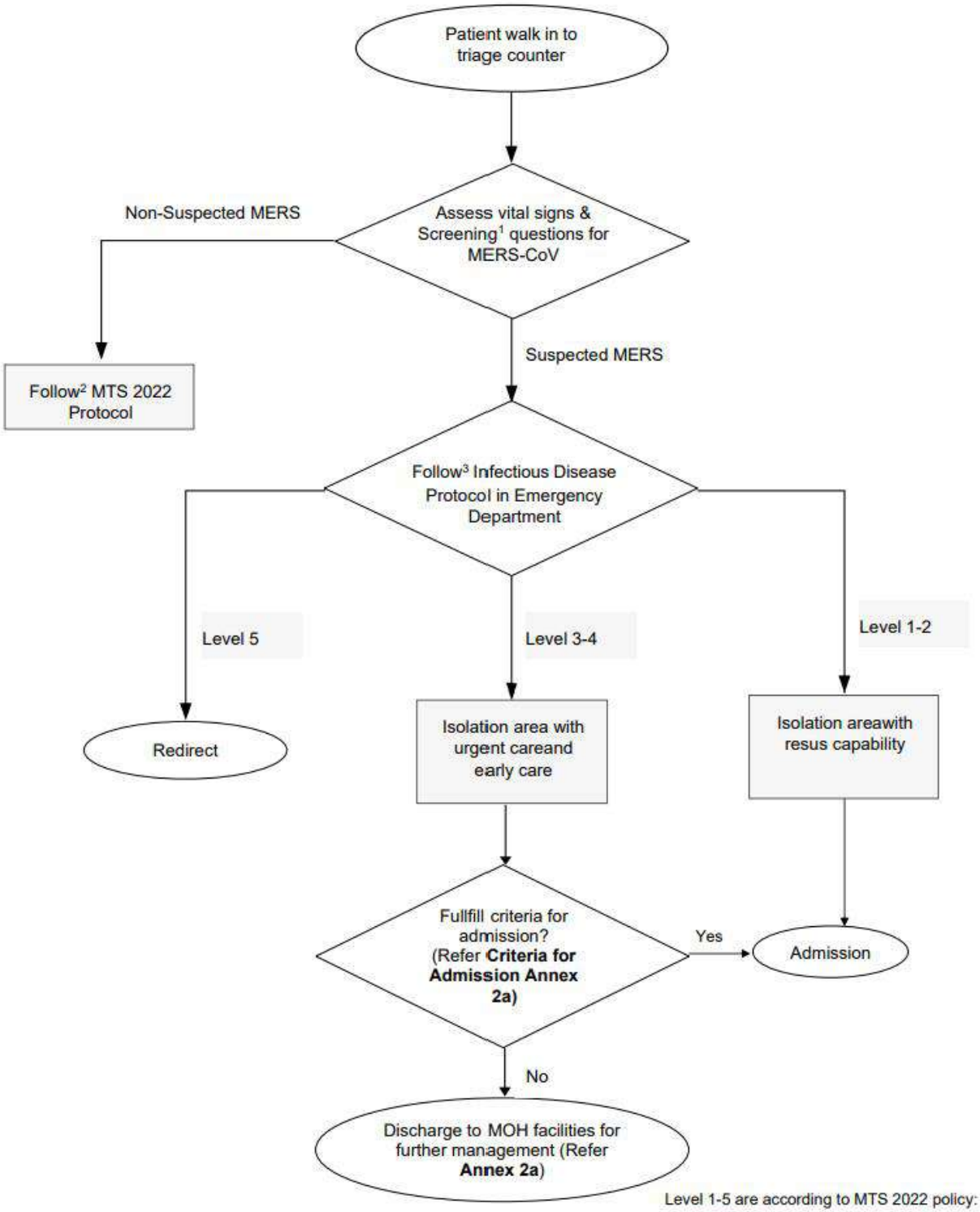
3. Decision for admission is based on the severity assessment of the patient by the primary care/ Family Medicine Specialist / ID Physician.

4. Those who meet the case definition suspected of MERS with ANY signs of severe illness (but are not limited to) the following:
    i. Fever more than 2 days
    ii. SpO_2 less than 95%
    iii. Respiratory rate >25/min
    iv. Angina chest pain
    v. Unable to tolerate orally
    vi. Unable to ambulate without assistance
    vii. Reduced level of consciousness

Flow Chart for Management of Suspected Case of MERS in Emergency Department and Ward



Flowchart for Walk In MERS-CoV Patient to Emergency Department



Level 1-5 are according to MTS 2022 policy:

- LEVEL 1 - RESUSCITATION
- LEVEL 2 - EMERGENCY
- LEVEL 3 - URGENT
- LEVEL 4 - EARLY CARE
- LEVEL 5 - ROUTINE

Note:
1) According to latest National MERS-CoV guidelines
2) Malaysian Triage Scale 2022
3) As per other infectious disease triage guidelines (e.g Covid-19/ Influenza)

MERS: CLERKING SHEET

Patient Name :
IC/Passport No : Tel No :
Age : Gender : M / F
Address :

Next of Kin :
(Name &Contact)

Travel History:				
No.	**Country/State/Province Visited**	**Duration of Stay**		**Name of Airline & Flight No.**
		From (dd/mm/yr)	**To (dd/mm/yr)**	
1.				
2.				
3.				
Date of return to Malaysia:		Entry Point:		

A. Symptoms of acute respiratory illness		**B. Signs of respiratory illness**	
Date of Onset			
Fever		Clinical evidence of pneumonia	
Respiratory symptoms		Radiological evidence of pneumonia	
Other symptoms		Other clinical signs	

C. Severity ***If YES to any of the questions below, considered moderate to severe illness***			
Respiratory rate (per min)	/min	*Moderate to severe if > 24/min*	Yes ( ) No ( )
Oxygen saturation	%	*Moderate to severe if SpO_2 ≤92%*	Yes ( ) No ( )
Blood pressure	mmHg	*Moderate to severe if < 90/60 mmHg*	Yes ( ) No ( )

Inability to speak in full sentences	Yes ( ) No ( )	Rapidly progressive disease	Yes ( ) No ( )
Breathing with accessory muscles	Yes ( ) No ( )	Persistent high fever > 3 days	Yes ( ) No ( )
Decreased effort tolerance	Yes ( ) No ( )	Severe and persistent vomiting and/or diarrhoea	Yes ( ) No ( )
Respiratory exhaustion	Yes ( ) No ( )		
Chest pains	Yes ( ) No ( )	New onset of confusion, agitation, seizures	Yes ( ) No ( )
Capillary refill time > 2 second	Yes ( ) No ( )		

D. Epidemiological Risk Assessment Within 14 days before onset of the illness, did you:*(Please tick the relevant answer)*	
	Close contact with a confirmed or probable case of MERS infection;
	Resides or travelled to the Middle East or countries where MERS-CoV is known to be circulating in dromedary camels or where human infections have recently occurred;
	Direct contact with dromedary camels or consumption or exposure to dromedary camel products (raw meat, unpasteurized milk, urine) in countries where MERS is known to be circulating in dromedary camel populations or where human infections occurred as a result of presumed zoonotic transmission

Clerked by :
Designation :
Date: :

MERS: SCREENING AND TRIAGING

- A dedicated isolation area should be identified for suspected MERS after being triaged.

- The suspected case should be managed by a dedicated team where possible.

- All patients who come to the respective health facilities should be screened for suspected MERS at triage as per Malaysian Triage Protocol for infectious disease (2023rd edition). – latest Triage Protocol for KKM ETD

WHEN SHOULD YOU SUSPECT MERS?

- MERS is to be suspected when a patient presents to Triage Counter (Refer Annex 2a for suspected case definition).

- Should a patient fulfill the description, to institute infection prevention and control measures as the following:

  - ✓ Place patients at least one (1) meter away from other patients or health care workers. Emergency Departments are to prepare an isolation area / room for patients.
  - ✓ Ensure strict hand hygiene for all staff and suspected patient.
  - ✓ Provide surgical mask to patients if not contraindicated.
  - ✓ Personal protective equipment (PPE) as per recommendation should be worn by the health care workers (HCWs) at all times when dealing with these patients.
  - ✓ After the encounter, ensure proper disposal of all PPE as in the guideline of clinical waste management (*Akta Kualiti Alam Sekeliling 1974 [AKTA 127] Peraturan-peraturan Kualiti Alam Sekeliling (Buangan Terjadual) Pindaan 2007*).

Note: [1] Search recent affected countries with link; https://www.emro.who.int/pandemic-epidemic-diseases/outbreaks/index.html

PROTOCOL FOR AMBULANCE TRANSFER FOR PATIENT SUSPECTED OF MERS

A. PREPARATION OF THE AMBULANCE

- It is advisable to remove all non-essential equipment related to the care of the intended patient.

- Ambulance must be equipped with spillage kits, disinfectant wipes, sharps bin and clinical waste ready to be used by responders.

- Use of disposable bed sheets is encouraged.

B. NUMBER OF PATIENTS IN AN AMBULANCE

- There is no mixture of suspected patients with confirmed MERS cases.

C. PREPARATION OF STAFF

- All staff accompanying patient at the rear of the ambulance must wear the recommended PPE:
  - Gloves.
  - Surgical Masks with shield or goggles.
  - Disposable apron or gown.
  - If the responder performs aerosol-generating procedures, the N95 mask must be used.

D. CARE OF THE PATIENT DURING TRANSPORT

1. Respiratory Hygiene

- In absence of respiratory distress, patients can be provided with surgical mask.
- Oxygen supplements using nasal prongs can be safely used under a surgical mask.

2. Intervention in Pre-Hospital

- Do not perform any procedures on the patient unless absolutely necessary.

3. Communication with Medical Emergency Call Centre (MECC) and Receiving Facility

- MECC must be informed regarding estimated time of arrival, patients' clinical condition or any updates in clinical status or transportation.
- It is the responsibility of MECC to inform and update receiving facility regarding estimated time of arrival and patients' clinical condition.

E. DECONTAMINATION

- If spillage occurs in the ambulance
  - Use chlorine granules in the spillage kit to absorb the spill.
  - After 2 minutes or when the granules crystallize, cover the spillage with the absorbent material e.g. tissue or blue sheet.
  - Do not remove the spill while the patient or staff is in the ambulance. The decontamination of the spillage is to be done at the designated hospital.

- Decontamination of the ambulance will use current Infection Prevention and Control recommendations.
  - The basic universal IPC for ambulance service are – change of linen, wipe of surface area such as stretcher mattress, and monitor wires or cuffs that are in contact with patient.
  - Additional IPC will be based on IPC recommendations either at MOH or local facility.

- Decontamination of staff
  - Staff from other health facility that accompany patient remove their personal protective equipment before returning to their respected base.
  - Any additional decontamination steps will be based on IPC recommendations either at MOH or local facility.

F. DISINFECTION OF REUSABLE UTENSILS & DISPOSAL OF WASTE

- All reusable patient care utensils should be put into the appropriate biohazard receptacles and labelled for cleaning and disinfecting later.

- All waste disposals from the affected patient should follow guidelines of Clinical Waste Management.

GUIDELINES ON INFECTION PREVENTION AND CONTROL (IPC) MEASURES IN MANAGING SUSPECTED, PROBABLE OR CONFIRMED MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS (MERS) INFECTION

1. INTRODUCTION

Major outbreaks which occurred over the last decade such as Ebola virus disease, Middle East respiratory syndrome coronavirus (MERS), and the recent coronavirus disease 2019 (COVID-19) pandemic, have demonstrated how epidemic-prone pathogens can spread rapidly through healthcare settings.

These events have also highlighted the importance of infection prevention and control (IPC) programmes as a basic requirement for outbreak preparedness and a critical element of readiness in building resilient healthcare system.

The aims of IPC in outbreak preparedness are:

- To reduce transmission of healthcare associated infection (HCAI)
- To enhance the safety of healthcare workers (HCWs), patients, carers and visitors
- To enhance the ability of health facility to respond to an outbreak
- To lower or reduce the risk of the hospital itself amplifying the outbreak

2. INFECTION PREVENTION AND CONTROL (IPC) GUIDING PRINCIPLES

Effective IPC programmes which include the WHO IPC Core Components are essential in preventing the spread of MERS in healthcare settings. It is evidence that, deficiency in the application of standard IPC precautions when caring for patients with probable or suspected cases resulting in transmission of MERS infection.

The principles of IPC are to prevent or limit transmission in healthcare facilities which includes:

i. Ensuring triage, early and rapid recognition AND source control that includes promotion of respiratory hygiene.
ii. Application of routine IPC precautions (Standard Precautions) for all patients.
iii. Implementing Additional precautions (Transmission Based Precautions) in selected patients (i.e., contact, droplet, airborne) based on the presumptive diagnosis.
iv. Implementing administrative control which include provision of adequate and regular supply of personal protective equipment (PPE) and appropriate training of HCW.
v. Using environmental and engineering control to support IPC activities.

2.1. TRIAGE, EARLY AND RAPID RECOGNITION AND SOURCE CONTROL

2.1.1. Rapid case identification of visitors, accompanying persons, patients and HCW should be done at all entry points of the healthcare facility.

2.1.2. A well-established and well-equipped triage station should be available at the POINT OF ENTRY to hospital emergency departments, health clinics/private GP clinics /fever centres.

2.1.3. Post visual alerts (in appropriate languages) at the entrance to outpatient facilities (e.g., emergency departments, physician's offices, outpatient clinics) instructing patient and the persons who accompany them to inform healthcare personnel of symptoms of a respiratory infection or symptoms related to **MERS** when they first register for care, and practice respiratory hygiene/cough etiquette.

2.1.4. Use physical barriers to reduce exposure to the **MERS-CoV** virus, such as blind/glass/plastic windows.

2.1.5. Screening of patients, visitors and others;

i. Screening questions should include the epidemiological link (i.e. close contact history) and clinical presentation.
ii. Train HCW on the signs and symptoms of **MERS** based on the latest case definitions.

2.1.6. Resources for performing hand hygiene (alcohol-based hand rub made available) at all entrances (e.g., screening areas), counters, waiting areas and common areas (e.g., pantry, meeting room) as well as the availability of disinfectant wipes for regular cleaning of high touch areas.

2.1.7. Provide tissues with a no-touch bin for disposal of tissues/biohazard bag.

2.1.8. HCW should always maintain physical distancing more than 1 meter from patients, visitors and other HCW.

2.1.9. HCWs should wear a well fitted surgical mask and other PPE based on the risk assessment.

2.1.10. If visitors, accompanying persons or patients has ARI or fulfil the criteria of suspected **MERS** based on the screening questionnaire, they should be sent to the dedicated waiting area (such as isolation or negative pressure room/tent or areas with natural ventilation) which is well ventilated with spatial separation of at least 1 – 2 meters between patients in the waiting rooms.

2.1.11. Must offer surgical mask (not N95 mask) if able to tolerate (not tachypneic, not hypoxic). If they are unable to tolerate it, advise the patient to cover nose and mouth during coughing or sneezing with tissue or flexed elbow.

2.1.12. Cleaning of high touch areas (i.e., chair, table, couch) at waiting and triage areas after patient leaves the area or as required (i.e., spillage, soiling).

2.1.13. Examination/ isolation room:

i. Examination/ isolation room at entry points (i.e., ED/ primary care etc) should be in descending order of preference:
   a. Single room (nursed with door closed) and attached bathroom
   b. Single room

ii. Make sure the rooms are adequately ventilated either by natural ventilation (opening windows) or mechanical ventilation.

2.2. STANDARD PRECAUTIONS

Standards Precautions are routine IPC precautions that should apply to ALL patients, in ALL healthcare settings. In addition, risk assessment is crucial for all activities because it helps to assess activity and PPE needed for adequate protection for each activity.

The precautions, described in detail within Chapter 3 of the 'Policies and Procedures on Infection Prevention and Control – Ministry of Health Malaysia; 2019' are:

2.2.1. HAND HYGIENE

- Hand hygiene is a simple and effective way to prevent the spread of infectious pathogen in healthcare settings.

- Hand hygiene should be done according to WHO 5 moments of hand hygiene:
  - Before touching a patient;
  - Before any clean or aseptic procedure;
  - After body fluid exposure risk;
  - After touching a patient; and
  - After touching a patient's surroundings, including contaminated items or surfaces.

- Use appropriate product and technique as below:
  - Alcohol-based hand rub (if hands are not visibly soiled) for 20-30 seconds.
  - Soap and water (when hands are visibly dirty or contaminated) for 40 seconds.

- Display visual aid such as poster or infographic on hand hygiene within the health facility.

- HCW should ensure bare below the elbow during patient care to avoid contamination of clothes.

2.2.2. PERSONAL PROTECTIVE EQUIPMENT (PPE)

- PPE should be used according to the setting, target personnel, risk of exposure (e.g., type of activity) and the mode of transmission of the pathogen (e.g., contact, droplet or aerosol).

- The effectiveness of PPE depends on the following factors:
  - HCW training on donning and doffing of PPE
  - Prompt access to sufficient supplies
  - Provision of adequate PPE according to technical specifications
  - Appropriate hand hygiene
  - HCW compliance
  - Supervision and regular monitoring and feedback by IPC team

- The use of surgical mask by HCWs:
  - All HCW should ensure that their surgical masks are fitted properly to cover their mouth and nose.
  - Avoid touching mask without hand hygiene. In case they touched the mask, hand hygiene must be performed immediately.
  - Any soiled mask should be changed and discarded properly into a waste bin.

- Appropriate mask fitting should always be ensured [for particulate respirators e.g., N95, through initial fit testing and user seal-check (fit check), and for medical masks; through methods to reduce air leakage around the mask] as well as compliance with appropriate use of PPE and other precautions.

- Fit test is conducted to determine if there is a gap in the seal of the respirator used. It should be conducted at least once a year or whenever there is change in body habitus.

- Seal-check is conducted by the user to determine if the respirator is properly sealed to the face.

- Particulate respirator is preferred over well fitted surgical mask based on *Risk assessment:
  - where ventilation is known to be poor or cannot be assessed or the ventilation system is not properly maintained.
  - unable to maintain a 2-meter spatial distance.
  - prolong close contact, less than 1 meter.
  - if patients are unable able to wear a mask (e.g., patient is on oxygen/ breathless).
  - AGP / aerosol generating behaviour.

- The use of eye protection (face shield/ goggles) with surgical mask in clinical setting is required in an area with high risk of disease transmission.

- The rational of the use of eye protection is to protect the mucous membranes of the eyes, nose and mouth.

- Eye protection should also be worn when exposed to risk of airborne transmission and where there is a risk of contamination to the eyes from splashing of blood, body fluids, excretions or secretions (including respiratory secretions). In activities that have high risk of aerosolization and contamination such as performing AGP procedures. It is recommended to wear a face shield rather than goggles.

2.2.3. DISINFECTION AND STERILISATION

- All single-use medical equipment should not be re-used.

- All reusable medical equipment (e.g., blood glucose meter and other point-of-care devices, surgical instruments, endoscope) is cleaned and reprocessed appropriately prior to use on another patient.

- Reusable medical equipment must be cleaned and reprocessed according to general protocols for disinfection and sterilization:
  - If not visibly soiled, wipe external surfaces of large portable equipment (e.g., X-ray machines and ultrasound machines) that have been used in the isolation room or area with an approved hospital disinfectant upon removal from the patient's room or area.
  - Proper cleaning and disinfection of reusable respiratory equipment is essential in in-patient care.

- Follow the manufacturer's recommendations for use or dilution, contact time and handling of disinfectants.

2.2.4. ENVIRONMENTAL HYGIENE (CLEANING AND DISINFECTION)

- Ensure environmental cleaning and disinfection procedures are followed consistently and correctly as per healthcare facilities' recommendations.

- Clean and disinfect surfaces that are likely to be contaminated with pathogens, including those that are in close proximity to the patient (e.g., bed rails, over bed tables) and frequently-touched surfaces in the patient care environment (e.g., door knobs, surfaces in and surrounding toilets in patients' rooms).

- Recommended frequency of cleaning and disinfection of environmental surfaces in healthcare facility settings are listed in Table 1.

- Cleaning should be done from the least soiled (cleanest) to the most soiled (dirtiest) areas, and from the higher to lower levels and using standard hospital-registered disinfectants, such as sodium hypochlorite 1000 ppm.

- If visible contamination or spills, it is recommended to use a higher dilution of EPA registered disinfection such as sodium hypochlorite at 10,000ppm. Refer to Table 2 for the preparation of Sodium Hypochlorite.

Table 1 Recommended frequency of cleaning of environmental surfaces, according to the patient areas with suspected, probable or Confirmed MERS in healthcare setting

Patient area	Frequency [a]	Additional guidance
Screening/triage area	At least twice daily	• Focus on high-touch surfaces, then floors (last)
Inpatient rooms/ cohort – occupied	At least twice daily, preferably three times daily, in particular for high-touch surfaces	• Focus on high-touch surfaces, starting with shared/common surfaces, then move to each patient bed; use new cloth for each bed if possible; then floors (last)
Inpatient rooms – unoccupied (terminal cleaning)	Upon discharge/transfer	• Low-touch surfaces, high-touch surfaces, floors (in that order); waste and linens removed, bed thoroughly cleaned and disinfected
Outpatient/ ambulatory care rooms	After each patient visit (in particular for high touch surfaces) and at least once daily terminal clean	• High-touch surfaces to be disinfected after each patient visit • Once daily low-touch surfaces, high touch surfaces, floors (in that order); waste and linens removed, examination bed thoroughly cleaned and disinfected
Hallways/ corridors	At least twice daily [b]	• High-touch surfaces including railings and equipment in hallways, then floors (last)
Patient bathrooms/ toilets	• Private patient room toilet: at least twice daily • Shared toilets: at least three times daily	• High-touch surfaces, including door handles, light switches, counters, faucets, then sink bowls, then toilets and finally floor (in that order) • Avoid sharing toilets between staff and patients

[a] Environmental surface should also be cleaned and disinfected whenever visibly soiled or if contaminated by a body fluid (e.g., blood);
[b] Frequency can be once a day if hallways are not frequently used

Source: Cleaning and disinfection of environmental surfaces in the context of COVID-19 Interim guidance, World Health Organization, 15 May 2020

Table 2: Preparation of Sodium Hypochlorite

Concentration of Disinfectant		Total 2.5gm Disinfectant Tablets to be used	Water Volume (ml)	Usage
10,000ppm	1%	7	1,000ml	• Spillage management • Wiping and cleaning of blood/body fluids on surfaces of non-critical items
5,000ppm	0.5%	4	1,200ml	• Wiping of external surface of soiled linen bag
1,000ppm	0.1%	1	1,000ml	• General cleaning

- For ISOLATION ROOM, terminal cleaning and disinfection should be done following discharge/transfer of a patient. The steps for terminal cleaning are followed:

  - Before entering the room, cleaning equipment should be assembled before applying PPE.
  - PPE must be removed, placed in an appropriate receptacle and hands cleaned before moving to another room or task.
  - PPE must not be worn or taken outside the patient room or bed space.
  - Protocols for cleaning must include cleaning of portable carts or built-in holders for equipment.
  - The room should be decontaminated from the highest to the lowest point and from the least contaminated to the most contaminated.
  - Remove curtains and placed in red linen bag with alginate plastic.
  - Use disinfectants such as sodium hypochlorite. The surface being decontaminated must be free from organic soil. A neutral detergent solution should be used to clean the environment prior to disinfection or a combined detergent/disinfectant may be used.

- In addition to the above measures, the following additional measures must be taken when performing terminal cleaning for Airborne Infection Isolation Rooms (AIIR).

  - The cleaner should wait for sufficient air changes to clear the air before cleaning the room.

  - After patient/resident transfer or discharge, the door must be kept closed and the Airborne Precautions sign must remain on the door until sufficient time has elapsed to allow removal of airborne microorganisms. Duration depends on ACHR;

    - With ACHR of 12 or 15, the recommended duration is 23 to 35 minutes and 18 to 28 minutes with 99%-99.9% efficiency respectively.

    - When the ACHR cannot be determined it is recommended that the room is left for time interval of 45 minutes before the cleaning and disinfectant is commenced.

2.2.5. **WASTE, LINEN AND SPILLAGE MANAGEMENT**

- General waste should be segregated from infectious waste.

- Infectious waste should be handled and treated in accordance with healthcare facility policies and local regulations.

- HCW who involved in waste management should be trained and wear appropriate PPE.

- Contaminated linen should be handled with minimal manipulation to prevent contamination of the air, surfaces and persons. DO NOT:
  - Carry contaminated linen against body.
  - Shake the linen.
  - Place used linen on the floor or other surfaces.
  - Overfill the laundry basket.

- The steps for handling linen:
  - Place the linen directly into red alginate plastic and secure, if there is any solid excrement on the linen, such as feces or vomit it should be segregated and removed first.
  - Place red alginate plastic into the red linen bag.

- All linen should be handled inside the isolation room/cohort area/ward.

- Store all used linen in a designated area (e.g., closet or room).

- HCW handling soiled bedding, towels and clothes from patient should wear appropriate PPE, which includes surgical mask, gloves, eye protection (face shield/goggles), long-sleeved plastic apron, boots or closed shoes before touching any soiled linen.

- Washing/disinfecting linen should be handled according to healthcare facilities protocol.

2.2.6. SAFE INJECTION PRACTICES, SHARPS MANAGEMENT AND PREVENTION OF NEEDLE STICK INJURIES

The seven steps to safe injections are:

i. Clean workplace
ii. Hand hygiene
iii. Sterile safety-engineered syringe
iv. Sterile vial of medication and diluent
v. Skin cleaning and antisepsis
vi. Appropriate collection of sharps
vii. Appropriate waste management

2.2.7. RESPIRATORY HYGIENE/COUGH ETIQUETTE

- Should be applied by all individual with respiratory symptoms.

- All individuals (HCWs, patients and visitors) with signs and symptoms of a respiratory infection should:
  - Use surgical mask
  - Cover their mouth and nose when coughing/sneezing.
  - Use tissues, handkerchiefs, cloth/fabric or surgical masks and dispose them into waste containers.
  - Encourage to perform handwashing.
  - Kept at least 1 metre from other patients.

- Visual alert / aids should be placed to remind patients and visitors to practice respiratory hygiene/cough etiquette.

- Surgical mask, tissues and hand washing facilities should be made available in all areas.

2.3. INFECTION PREVENTION AND CONTROL MEASURES WHEN CARING FOR PATIENTS WITH CLINICALLY SUSPECTED OR PROBABLE OR CONFIRMED MERS INFECTION

In addition to Standard Precautions, **Contact and Droplet precautions** should be applied when caring the patient with clinically suspected or probable/ confirmed MERS infection.

2.3.1. **Patient placement on admission**

Patient shall be placed in negative pressure single room with en-suite bath. If unavailable, may consider (descending order of preference):

i. Adequately ventilated single room (nursed with door closed) and en-suite bath.
ii. Adequately ventilated single room.
iii. When single room is not available, cohort confirmed MERS CoV patient is allowed and patient should be placed at least 1 meter apart. suspected and probable patient awaiting result should be placed in an isolation room.

2.3.2. **Personal protective equipment (PPE)** required, when in close contact (within 1m) or upon entering the room or cubicle of patients;

i. Surgical mask
ii. Eye protection (i.e. goggles or a face shield)
iii. Long sleeved, fluid resistant gown or long-sleeved plastic apron
iv. Gloves

CLINICAL AREAS BEFORE ENTERING A ROOM/PATIENT AREA WHERE THERE IS A SUSPECTED/PROBABLE /CONFIRMED MERS CASE:

EMERGENCY DEPARTMENT / INPATIENT CARE

SETTING: ISOLATION ROOM / AREA

TARGET: ALL STAFF

ACTIVITY	TYPE OF PPE
1. History taking and physical examination 2. Other procedures (non aerosol generating procedure e.g. taking vital signs, dressing procedure)	1) Well fitted surgical mask 2) Eye Protection (face shield/ goggles) 3) Isolation gown (fluid resistant long sleeve gown/ long sleeved plastic apron) 4) Gloves

2.3.3. Patient care equipment

- Dedicate the use of non-critical patient-care equipment (e.g., stethoscope, sphygmomanometer, thermometer or bedside commode).

- If unavoidable, then adequately clean and disinfect it after each patient use with hospital recommended disinfectant (e.g., ethyl alcohol 70%). Refer Table 3.

Table 3: Recommendations for methods of disinfection (reused equipment)

Items	Recommendation	Minimum Frequency/ Cleaning Process
Blood pressure cuffs	Wipe with low-level disinfectant e.g., 70% alcohol or hypochlorite solution or QUAD wipes	In between patients
Stethoscope	• Wipe with 70% alcohol • Option: disposable stethoscope cover	In between patients or use designated stethoscope for infectious or high-risk patient
Thermometer	Use sheath cover or wipe with 70% alcohol	After every use
Otoscope Handle	Wipe with low-level disinfectant e.g., 70% alcohol or hydrogen peroxide 0.5% wipes	In between patients

2.3.4. Patient transfer and transport within and outside the healthcare facilities

- Avoid the movement of patients unless medically necessary e.g. use designated portable X-ray equipment instead of bringing patient to radiology.

- If movement of patient is required, use pre planned routes that minimize exposure to other staff, patients and visitors.

- Patient should wear a surgical mask (not N95 mask) if not in respiratory distress. Oxygen supplement using nasal prong can be safely used under a surgical mask. If patient is unable to tolerate surgical mask, advise the patient to cover nose and mouth during coughing or sneezing.

- Notify the receiving area of the patient's diagnosis and necessary precautions before sending the patient.

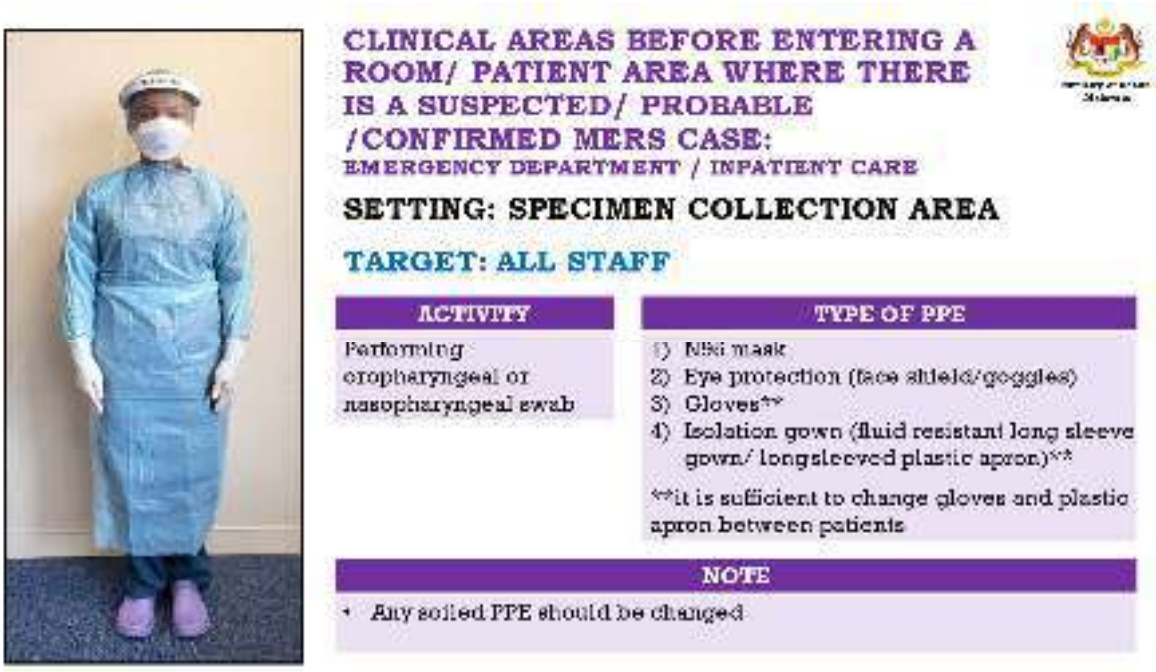
- Clean and disinfect patient-contact surfaces (e.g., bed, wheelchair, incubators) after use.

- Ensure HCWs transporting patients must wear appropriate PPE.

2.3.5. Specimen collection and transport

- All specimens should be regarded as potentially infectious, and HCW who collect or transport clinical specimens should adhere rigorously to Standard Precautions, to minimize the possibility of exposure to pathogens.

- Ensure that HCW who collect specimens wear appropriate PPE (refer infographic).



- Ensure that HCW who transport specimens are trained in safe handling practices and spill decontamination procedures.

- Place specimens for transport in leak-proof specimen bags (please refer to Annex 5 Guidelines on Laboratory Testing for MERS).

- Deliver all specimens by hand whenever possible. Do not use pneumatic-tube systems to transport specimens.

- State the name of patient clearly on the accompanying request form. Notify the laboratory as soon as possible that the specimen is being transported.

2.3.6. **Dishes and eating utensils**

- Use disposable utensils if available.
- Wash reusable items in a dishwasher.
- If dishwasher is not available, wash items thoroughly with either soap or detergent and water as per healthcare facilities guidelines.
- Healthcare facilities may consider using the same utensil for the specific patients during their hospital stay.

2.3.7. **Patient record/bed head ticket (BHT)**

- Bed head ticket (BHT) should be tagged.
- Patient record/BHT preferably be kept outside the patient room.
- Perform hand hygiene each time after handling patient record/ BHT.

2.3.8. **Healthcare Worker (HCW)**

- Assign or create a dedicated team consisting of specialist, medical officer, nurses, and other supportive staff to care for probable or suspected or confirmed MERS.
- HCW with high risk condition or immunocompromised should not be allowed to managing and providing routine care for MERS cases.
- HCW need to be trained on proper use of PPE.
- Keep a register of HCW who have provided care for patients with suspected or probable or confirmed MERS for contact tracing.
- HCWs who are managing and providing routine care for suspected or probable or confirmed MERS patient should be monitored for symptoms daily. If HCWs become symptomatic, he/she need needs to report to the supervisor in the team and managed accordingly (refer Annex 19: Monitoring Form for Personnel Potentially Exposed to MERS Infection).

2.3.9. **Visitors or caregivers**

- No visitor should be allowed unless visitors who are essential such as;
  - patients with critical illness, palliative care, hospice care and end of life.
  - patients who need assisted care, e.g., help patient to mobilize, personal care especially for patients with disabilities, critically ill, elderly or postoperative patients.

- patients who need assistance for communication, such as those with hearing, visual, speech, cognitive, intellectual or memory impairments.
- patients require emotional and support in decision making.
- paediatric and mothers in labour.

- If absolutely necessary, discuss with the managing team. Approval is based on the discretion of the attending team and hospital policy.

- Thorough advice and counselling should be given and written consent should be taken prior to visitation based on hospital policy.

- Document and limit the number of visitors at scheduled time. Advice family members to assign a single visitor or caregiver who is not at high risk for MERS infection to visit or taking care the patient.
- Visitors or caregivers should be advised to limit their movement in the healthcare facility.

- HCW should educate and supervise the visitors or caregivers on hand hygiene (before entering and leaving the room), respiratory etiquette, physical distancing (maintain at least 1 metre), use of PPE and other IPC measures as well as on how to recognize the signs and symptoms of MERS.

- HCW must instruct and supervise all visitors or caregivers on the donning and doffing of PPE before entering the room.

- Appropriate instruction on should be given while in the patient's room.

- PPE recommend for these long-term carers may be limited to surgical mask. The use of plastic apron and gloves are recommended when anticipating exposure to bodily fluids.

- Exposed visitors or caregivers should report any signs and symptoms to their healthcare providers.

- No visitors or caregivers should be allowed during AGP procedure.

2.4. INFECTION PREVENTION AND CONTROL MEASURES FOR AEROSOL-GENERATING PROCEDURES (AGP) FOR PATIENTS WITH CLINICAL SUSPECTED OR PROBABLE/CONFIRMED MERS INFECTION – AIRBORNE PRECAUTIONS

2.4.1. An aerosol-generating procedure (AGP) is defined as any medical procedure that can induce the production of aerosols of various sizes, including small (< 5μm) particles over a long distance (>1m). The aerosol-generating procedures include:

- Tracheal intubation, extubation and related procedures
- Tracheotomy/tracheostomy procedures
- Manual ventilation
- Suctioning
- Bronchoscopy
- Nebulization
- Non-invasive ventilation (NIV) e.g. Bi-level Positive Airway Pressure (BiPAP) and Continuous Positive Airway Pressure ventilation (CPAP)
- High-frequency oscillating ventilation (HFOV)
- High-flow Nasal Oxygen (HFNO)
- Induction of sputum (using nebulized hypertonic saline)
- Chest physiotherapy
- Dental procedures
- Surgery and post-mortem procedures in which high-speed devices are used

2.4.2. Additional Airborne precautions when performing AGP includes the use of (refer infographic below);

i. A particulate respirator at least as protective as a NIOSH-certified N95 or equivalent
Note: always perform seal check when putting on a particulate respirator.

ii. Powered air-purifying respirator (PAPR) where available is utilized instead of a respirator

iii. Eye protection (i.e. goggles or a face shield);

iv. Fluid resistant, long-sleeved gown or long-sleeved plastic apron

v. Gloves (some of these procedures require sterile gloves)

CLINICAL AREAS BEFORE ENTERING A ROOM/PATIENT AREA WHERE THERE IS A SUSPECTED/ PROBABLE / CONFIRMED MERS CASE:
EMERGENCY DEPARTMENT / INPATIENT CARE

SETTING: ISOLATION ROOM / AREA

TARGET: ALL STAFF

ACTIVITY	TYPE OF PPE
Performing Aerosol Generating Procedures (AGP) • Intubation,extubationand related procedures/ CPR • Tracheotomy/ tracheostomy procedures • Manual ventilation • Suctioning • Bronchoscopy • Nebulization • Others – Refer Guideline	1) N95 mask/ PAPR 2) Eye protection (face shield/ goggles) 3) Isolation gown (fluid resistant long sleeve gown/ long sleeved plastic apron) 4) Gloves

2.4.3. Patient placement during AGP should be in descending order of preference:

i. Negative pressure rooms/AIIR room.
ii. Adequately ventilated single room with at least natural ventilation with at least 160 L/s/patient air flow, with closed doors **(use with HEPA filter if possible).**

2.4.4. Airborne precaution also recommended when taking oropharyngeal/ nasopharyngeal swab.

2.4.5. Limit the number of persons present in the room during the procedure and no visitor are allowed.

2.4.6. Follow WHO guidance for steps of donning and doffing PPE. Perform hand hygiene before and after contact with the patient and his or her surroundings and after PPE removal.

2.5. ADMINISTRATIVE CONTROLS

2.5.1. Implementing administrative control and policies in order to prevent and control the transmission of infectious disease within the healthcare facility as well as to ensure the safety of HCW, patient and visitors.

2.5.2. The examples of administrative control implemented by the healthcare facility includes;

- Develop policies/guidelines
- Regular education and training on IPC to all category of HCW including patient and visitors
- Access to prompt laboratory testing for identification of the etiologic agent
- Monitor the HCW compliance to standard precautions and SOPs
- Establish active syndromic surveillance of HCW.
- Establish infrastructure which support the IPC activities
- Adequate patient to staff ratio in order to reduce burden and stress to staff.
- Provision of adequate and regular supply of personal protective equipment (PPE) and appropriate training of staff.

2.6. ENVIRONMENTAL AND ENGINEERING CONTROLS

2.6.1. Engineering control is one the crucial principles in hierarchy of controls within the healthcare facility in order to prevent the transmission of infectious disease.

2.6.2. For further details, refer to Guideline on Ventilation in Healthcare Facilities to Reduce Transmission of Respiratory Pathogen (https://drive.google.com/uc?id=18NfPw9TvN4Hh6akNm9dSsLT10McPKvQ0).

References:

1. Guidelines on Ventilation in the Healthcare Setting to Reduce the Transmission of Respiratory Pathogens, First Edition, July 2021.

2. Home care for patients with Middle East respiratory syndrome coronavirus (MERS) infection presenting with mild symptoms and management of contacts, Interim guidance, June 2018, WHO/MERS/IPC/18.1

3. Infection prevention and control of epidemic and pandemic prone acute respiratory infections in health care - WHO Guidelines. Geneva, World Health Organization, 2014.

4. Infection prevention and control during health care for probable or confirmed cases of Middle East respiratory syndrome coronavirus (MERS) infection, Interim guidance, Updated October 2019, WHO/MERS/IPC/15.1 Rev 1

5. Policies and Procedures on Infection Prevention and Control, Third Edition, 2019, Ministry of Health Malaysia.

INTENSIVE CARE PREPAREDNESS, INFECTION PREVENTION AND CONTROL (IPC) IN INTENSIVE CARE SETTING FOR MERS INFECTION

1. As MERS is a highly infectious disease with standard, airborne and contact precautions, those who need intensive care shall be cared for in the designated negative pressure isolation rooms/ ward (with directional airflow, minimum air exchanges of 12/ hour) identified in the individual hospital for management of patients with MERS.

2. Staff nurses shall be deployed to nurse patients who are mechanically ventilated.

3. When single rooms are not available, cohort patients together. Always place patient beds at least 1m apart.

   (a) Patients suspected or confirmed with MERS needing intensive care shall be cared for in designated isolation rooms identified for the individual

   (b) Ideally use airborne infection isolation room (AIIR) i.e. negative pressure isolation room with anteroom for confirmed or possible cases. In the event an AIIR is not available, the patient should be placed in a single room with closed doors.

IPC Measures During Aerosol-Generating Procedures (AGP)

Aerosol-generating procedures: include intubation, extubation, nasopharyngeal aspiration, open tracheal suctioning, tracheostomy care, chest physiotherapy, bronchoscopy, nebuliser therapy, HFNO2, NIV, CPR.

An aerosol-generating procedure (AGP) is defined as any medical procedure that can induce the production of aerosols of various sizes, including small (≤5 μm) particles over a long distance (> 1m).

1. Avoid or minimize the performance of AGP without compromising patient care

2. AGP should ideally take place in a negative pressure isolation room.

3. Limit the number of HCWs present during the procedure to only those essential for patient care and procedural support

4. PPE worn during AGP includes:

   - Fit-tested particulate respirator i.e. N-95 or Powered Air Purifying Respirator
   - Head cover
   - Long sleeve, fluid resistant gown
   - Eye protection with face shield or goggles
   - Gloves

5. Clean and disinfect procedure room surfaces promptly after the procedure

6. Practice hand hygiene.

7. Use PPE to avoid direct contact with patients' blood, body fluids, secretions (including respiratory secretions) and non-intact skin. Standard precautions also include prevention of needle-stick or sharps injury, safe waste management, cleaning and disinfection of equipment, and cleaning of the environment.

8. Use disposable respiratory equipment wherever possible. Reusable equipment shall be disinfected in accordance with local policy and manufacturers' guidelines.

9. Oxygen delivery devices and humidifiers

    9.1 For non-intubated patients requiring oxygen therapy, non-humidified oxygen can be delivered via nasal prongs or simple facemask.

    9.2 Generally, these low flow oxygen systems do not need to be humidified. The use of bubble-through water humidifiers at high flow rates (> 10L/min) can produce aerosols and thus is not recommended

10. Invasive ventilator

    10.1 Ventilators shall be identified only for use for patients with MERS.

    10.2 Ventilators shall be fitted with a viral filter. It is placed between the distal end of the expiratory breathing circuit and exhalation port of the ventilator.

    10.3 All respiratory equipment must be protected with a high efficiency filter

    10.4 Disposable ventilator circuits shall be used

    10.5 The ventilatory circuits shall not be disconnected unless absolutely necessary. Ventilators shall be put on standby mode or turned off if there is a need to disconnect the circuit.

    10.6 Do not change ventilatory circuits on a routine basis.

    10.7 Avoid water humidification

    10.8 Use a heat and moisture exchanger with viral filter (HMEF) at the Y-piece of the breathing circuit

11. During tracheal intubation

11.1 Whenever possible, only experienced doctors shall attempt intubation (the spread of infection at the time of intubation appears to be associated with difficult intubation, and prolonged manual ventilation).

11.2 Rapid sequence induction shall be practiced during intubation. Avoid awake intubation. Ensure the patient is adequately paralysed before attempting laryngoscopy.

11.3 A viral filter shall be fitted between the facemask and the manual resuscitator bag.

11.4 Minimise manual ventilation. If essential, it shall be carried out by two personnel; one holds the mask tightly against the patient's face while the other squeezes the bag gently.

11.5 Inflate the cuff of the endotracheal tube before ventilating the patient.

11.6 Turn on the ventilator only when it is connected to the endotracheal tube.

12. While on invasive ventilation

12.1 Mechanical ventilation creates high gas flows. Tracheal cuff pressures should be checked frequently and kept inflated at pressures of 25-30 cmH20 to create a good seal against the tracheal wall.

12.2 Avoid water humidification.

12.3 Use a combination of heat moisture exchanger with viral filter (HMEF) at the Y-piece of the breathing circuit. Note that each HMEF change results in a patient circuit disconnection and a short period of time when expired airborne particles are not filtered.

12.4 Use closed (in-line) tracheal suctioning systems. Do not disconnect from the ventilator and manually ventilate patients during suctioning. Instead, administer 100% oxygen on the ventilator during suctioning.

12.5 Use metered dose inhalers instead of small volume nebuliser if nebulisation of drugs is required.

12.6 When using a manual resuscitator bag, connect a viral filter between the endotracheal tube and the manual resuscitator bag.

12.7 Consider paralysing patients during bronchoscopy to minimise coughing.

13. Non-invasive ventilation

13.1 Avoid the use of non-invasive ventilation if patients are not nursed in single isolation rooms.

13.2 Consider the use of a breathing circuit with an expiratory port filter, which would need to be used with a closed (non-ported) facemask.

13.3 High flow nasal oxygen (HFNC) or non-invasive ventilation (NIV) should only be used in selected patients with hypoxemic respiratory failure.

DISCHARGE CRITERIA FOR A PREVIOUSLY CONFIRMED CASE OF MERS

- The duration of infectivity for MERS-CoV infection is unknown.

- While Standard Precautions should always be applied, isolation and droplet precautions should be used for the duration of symptomatic illness and continued for at least 24 hours after the resolution of symptoms.

- Testing for viral shedding should assist decision-making when readily available:

    - Repeat testing at 24 and 48 hours after symptoms resolve.
    - If two (2) repeated PCR tests are negative, may consider discontinuation of isolation and droplet precautions, after discussing with Infectious Disease Physician

GUIDELINES FOR THE HANDLING OF DEAD BODIES OF SUSPECTED OR CONFIRMED MERS INFECTION

A. GUIDELINE FOR TRANSPORTING BODIES WITH SUSPECTED OR CONFIRMED MERS INFECTION FROM EMERGENCY DEPARTMENT OR WARD TO MORTUARY

B. GUIDELINES FOR THE MANAGEMENT OF BROUGHT IN DEAD (BID) CASES DUE TO SUSPECTED OR CONFIRMED MERS INFECTION.

   B1. GUIDELINE FOR THE MANAGEMENT OF BROUGHT IN DEAD (BID) CASES WITH SUSPECTED OR CONFIRMED MERS INFECTION BY OTHER THAN POLICE TO THE EMERGENCY & TRAUMA DEPARTMENT

   B2. GUIDELINE FOR THE MANAGEMENT OF BROUGHT IN DEAD (BID) CASES WITH SUSPECTED OR CONFIRMED MERS INFECTION BY POLICE TO THE MORTUARY

C. GUIDELINE FOR THE DISPOSAL OF DEAD BODIES IN CASES DUE TO MERS INFECTION.

D. RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE) IN THE MANAGEMENT OF DEAD BODIES WITH SUSPECTED OR CONFIRMED MERS INFECTION

E. MANAGEMENT OF POST-MORTEM SPECIMENS IN CASES WITH SUSPECTED OR CONFIRMED MERS INFECTION

INTRODUCTION

This guideline is intended for all parties involved in the management of MERS infected bodies. The parties involved include all facilities under Ministry of Health Malaysia (MOH), private hospitals as well as other governmental and non-governmental agencies.

The MERS virus is classified as a zoonotic virus. The mode of transmission is by direct or indirect contact with infected dromedary camels in the Arabian Peninsula. Human-to-human transmission has occurred among close contacts and in healthcare settings. Outside the healthcare setting, there has been limited human-to-human transmission.

Any handling of a dead body is aerosol-generating procedure (AGP). As aerosol transmission is possible, handling of MERS infected bodies should be made at the minimum.

Key Considerations

- There was only 1 laboratory confirmed MERS fatality been reported in Malaysia as to date.

- MERS fatalities may occur in healthcare facilities, at home or in other locations.

- The safety and well-being of those who attend to dead bodies is critical. They should ensure strict compliance to PPE protocol.

- The decision on the risk of infectivity depends on various factors and should be made on a case-by-case basis. The decision should be made by a team consisting of the treating clinicians preferably ID physicians and the Forensic Medicine Specialist.

- For BID cases, the appropriate MERS risk assessment shall be undertaken

- For *mandi kapan* and religious rituals involving washing of bodies, these procedures should not be carried out in a room that has turbulent airflow such as fans, blowers and split air-conditioning.

A. GUIDELINES FOR TRANSPORT OF BODY WITH SUSPECTED OR CONFIRMED MERS INFECTION FROM EMERGENCY DEPARTMENT OR WARD TO THE MORTUARY

1. Bodies of suspected or confirmed MERS infection shall be sent from the Emergency Department (ED) or ward to the mortuary as soon as practicable.

2. Healthcare workers must comply with PPE protocol (refer Section D).

3. Sampling for all suspected MERS infection cases shall be taken in ED or ward by the respective team.

4. Relatives are **STRICTLY PROHIBITED** to handle the body.

5. Body shall be prepared in the ED or ward (i.e. the Last Office) by the healthcare workers in ED or ward before the body is sent to the mortuary.

6. Body preparation in the ED or ward:

   The body must be wrapped with linen and **placed into one (1) body bag. Then the body bag must be wiped or sprayed especially at and around the zipper with disinfectant (0.5% sodium hypochlorite).**

7. Body transfer from the ED or ward shall be carried out by minimum of 2 healthcare workers. The healthcare workers must wear appropriate PPE (refer Section D).

8. On arrival at the mortuary, the body must be immediately placed in a designated refrigerated body storage compartment/area.

B. GUIDELINES FOR THE MANAGEMENT OF SUSPECTED OR CONFIRMED MERS INFECTED BODIES BROUGHT IN DEAD (BID)

B1. Guideline for the Management of Suspected or Confirmed MERS infected BID by Other Than Police to ED

B2. Guideline for the Management of Suspected or Confirmed MERS infected BID by Police to the Mortuary

B1. GUIDELINE FOR THE MANAGEMENT OF SUSPECTED OR CONFIRMED MERS INFECTED BODIES BID BY OTHER THAN POLICE TO ED

1. The suspected or confirmed MERS infection cases may be BID to ED by those other than the police, such as the family members, members of the public or ambulance, depending on the circumstances.

2. It is recommended to perform PCR testing on suspected BID cases. Repeat testing for confirmed positive cases is not required.

3. Police report shall be lodged in accordance to ED protocol.

4. **For suspected** MERS infection.

   4.1 The sampling **shall be taken by the ED staff**. The body shall then be sent to the mortuary (refer Section A).

   The next of kin shall be informed by the ED staff regarding the sampling procedure, the turnaround time for the result and subsequent procedures that entail, depending on the MERS analysis results.

   4.2 If results **POSITIVE**:

   4.2.1 If post-mortem was **not requested** by the police:

   - The police officer or the respective Emergency Medical Officer may provide the cause of death and the ED staff shall notify the respective District health Office (PKD).

   - The body shall be released with strict adherence to the MERS infected **body disposal guideline** with all the necessary documents.

   4.2.2 If **post-mortem is required**, the respective Forensic Medicine Specialist/ Medical Officer shall perform the post-mortem examination and provide the cause of death.

   - The full/complete post-mortem examination shall be conducted in a **Biosafety Level (BSL) 3 post-mortem suite** or minimally in autopsy facilities with negative pressure post-mortem suite.

   - The body shall be released **with strict adherence to the** MERS infected body **disposal guideline** with all the necessary documents.

   4.3 If the result is **NEGATIVE**, the police shall be informed for subsequent medicolegal investigation of death regarding the necessity for post-mortem examination.

5. **For confirmed (known case)** MERS infection

   - The respective Emergency Medical Officer may provide the cause of death after discussion with clinicians preferably ID physicians**.** The body shall be sent to mortuary (refer Section A) and to be released accordance to the cases (infective or not infective) /with strict adherence to the MERS infected body disposal guideline with all the necessary documents.

   - The police shall be informed for subsequent medicolegal investigation of death regarding the necessity for post-mortem examination.

B2. GUIDELINE FOR THE MANAGEMENT OF BROUGHT IN DEAD (BID) CASES WITH SUSPECTED OR CONFIRMED MERS INFECTION BY POLICE TO THE MORTUARY.

1. The handling of body at the scene shall be done by the police and may be supervised by the respective Assistant Environmental Health Officer. The body must be placed into **one (1) body bag. The body bag must be wiped or sprayed especially at and around the zipper with disinfectant (0.5% sodium hypochlorite).**

2. The receiving mortuary staffs shall:
   2.1. Wear appropriate PPE.

   2.2. Obtain a police order (Polis 61) and/or 3A form (Refer Appendix B2(i)) for post-mortem examination.

   2.3. Communicate or discuss the case with the Forensic Medicine Specialist of the referral centre or department to decide the management of the post-mortem examination in suspected or confirmed MERS infection.

   2.4. Notify the case to the state CPRC or local hospital *Unit Kesihatan Awam*.

3. Samplings for MERS shall be taken in the designated mortuaries. Refer section D for appropriate PPE.

4. The body shall be kept in the designated body freezers until the laboratory test result of MERS infection is available.

5. If the result is **POSITIVE**, the police shall be informed for subsequent medicolegal investigation of death and the necessity for post-mortem examination:

   5.1 If post-mortem is required, the respective Forensic Medicine Specialist/ Medical officer shall perform the post-mortem examination, that includes Chest X-Ray, and provide the cause of death.

5.2 Full/complete post-mortem examination shall be conducted in a **Biosafety level (BSL) 3 post-mortem suite** or minimally in autopsy facilities with negative pressure post-mortem suite.

5.3 The body shall be released **with strict adherence to the** MERS infected **body disposal guideline** with all the necessary documents.

6. If the result is **NEGATIVE**, the police shall be informed for subsequent medicolegal investigation of death regarding the necessity for post-mortem examination.

C. GUIDELINE FOR THE DISPOSAL OF MERS BODIES.

1. It is recommended that MERS infected bodies (whether post-mortem is done or not) shall be disposed (burial or cremation) as soon as practicable.

2. For the purpose of identification of MERS infected body by relatives, the process shall be done in the mortuary with strict compliance to PPE requirements.

3. For bodies still pending MERS confirmatory results, the body shall still be handled as MERS infected bodies until the results are made available. This SOP is not applicable to non- MERS infected bodies.

4. For MERS infected bodies embalming must be avoided and repatriation **to** foreign countries is prohibited.

5. **Religious procedures for disposal of body** should be based on the risk of virus transmission as stated in the **Key Considerations section of this guideline**.

5.1. **Muslim body** may undergo "*mandi kapan"* (ritual bathing) but subject to the following recommendations:

- Avoid Aerosol Generating Procedures (AGP).
- Avoid using hand shower/jet spray and splashing water. However, it is recommended bottle spray to be used.
- The washing needs to be handled by trained individuals with proper PPE. Minimal PPE: N95, gloves, face shield, and long-sleeve water resistant gown.
- Family members/ relatives may be allowed (maximum 2 persons) to observe and to assist the "*mandi kapan"* with strict compliance to PPE and any safety instructions given.

N.B: However, for cases where full autopsy had been performed, where continuity of airways had been completely disrupted by the autopsy, these bodies might be considered for full *"mandi kapan".*

5.2. **For non-Muslim,** religious last rites/ritual may be conducted with minimal handling of the body subject to the following recommendations:

- Avoid Aerosol Generating Procedures (AGP).
- Avoid using hand shower/jet spray and splashing water. However, it is recommended bottle spray to be used.
- The washing needs to be handled by trained individuals with proper PPE. Minimal PPE: N95, gloves, face shield, and long sleeve water resistant gown.
- Family members/ relatives may be allowed (maximum 2 persons) to observe the **religious last rites/ritual** with strict compliance to PPE and any safety instructions given.
- **If change of clothing is needed, drape the clothing over the body.** Make sure the mouth and any wounds or leaks are covered with waterproof bandage or mask.

6. Once religious last rites/ritual are completed, body bag is zipped/sealed and the outer layer of body bag to be disinfect with 0.5% sodium hypochlorite.

7. All religious procedures should be conducted **ONLY** by trained funeral service personnel with strict adherence to SOP and appropriate PPE under the supervision of the Assistant Environmental Health Officer.

8. **Burial or cremation of MERS infected bodies.**

8.1. MERS infected bodies should be taken for burial or cremation directly from the mortuary as soon as practicable.

8.2. For non-Muslim, bodies may be placed in coffins with air-tight sealed glass cover. Body bag may be unzipped to expose the face. Outer surface of coffin to be disinfect with 0.5% sodium hypochlorite or 70% alcohol prior to viewing before burial or cremation.

8.3. Family members are prohibited from opening the sealed coffin or sealed body bag. Supervising Assistant Environmental Health Officer must ensure this precaution is strictly adhered to.

8.4. The burial or cremation process should be conducted by trained personnel with strict adherence to SOP and appropriate PPE under the supervision of the Assistant Environmental Health Officer.

9. Deaths occurring in private hospitals shall follow the same procedure as outlined above. The body is to be released for burial or cremation from the Private Hospital.

D. RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE) IN THE MANAGEMENT OF DEAD BODIES WITH SUSPECTED OR CONFIRMED MERS INFECTION

SETTING	TARGET PERSONNEL	ACTIVITY	TYPE OF PPE	NOTE
At site/ ward / ICU / ETD	HCW Police	Wrapping / handling of the body	● N95 mask ● Eye protection (face shield/ goggles) ● Isolation gown (fluid repellent long sleeved gown) ● Gloves **use of coverall does not offer additional protection and not recommended*	● Performing hand hygiene before and after interaction with the body
Ward / ICU / ETD / mortuary	HCW	Transfer of body to mortuary Receiving body from ward/ ED or police	● Surgical mask ● Eye protection (face shield/ goggles) ● Isolation gown (fluid repellent long sleeved gown) ● Gloves	
Ward / ICU / ETD / Mortuary	HCW	Performing Nasopharyngeal / oropharyngeal swab sampling or other non-invasive sampling (including packaging / labelling of specimens)	● N95 mask ● Eye protection (face shield/ goggles) ● Long sleeved plastic apron ● Gloves **use of coverall does not offer additional protection and not recommended*	
		Transport of specimens	● Surgical mask	

SETTING	TARGET PERSONNEL	ACTIVITY	TYPE OF PPE	NOTE
Autopsy room	HCW	Performing autopsy ● Confirmed MERS infection ● Suspected/SARI/ ARI/ILI (if high index of suspicion)	● PAPR ● Eye protection (face shield/ goggles) ● Isolation gown (fluid repellent long sleeved gown) ● Gloves ● Boots/footwear protection	● Autopsy should be performed at Biosafety level (BSL) 3 autopsy room or BSL 2 with negative pressure autopsy room ● Instruments used during mortuary care, or during the autopsy should be cleaned and disinfected immediately after use.
		Performing autopsy ● with low index of suspicion	● N95 mask ● Eye protection (face shield/ goggles) ● Isolation gown (fluid repellent long sleeved gown) ● Gloves ● Boots/footwear protection	● Autopsy can be performed at Biosafety Level (BSL) 2 ● Instruments used during mortuary care, or during the autopsy should be cleaned and disinfected immediately after use.
Mortuary	HCW / Religious body handlers / Funeral service personnel	Washing the body / shrouding (kafan)	● N95 mask ● Eye protection (face shield/ goggles) ● Isolation gown (fluid repellent long sleeved gown) ● Plastic apron ● Gloves ● Boots/footwear protection	● Religious body handlers / funeral service personnel should be trained in washing the body and donning and doffing of PPE ● Performing hand hygiene before and after interaction with the body

SETTING	TARGET PERSONNEL	ACTIVITY	TYPE OF PPE	NOTE
Mortuary	Family members / next of kin	Viewing of body for identification	● Surgical mask ● Gloves * ● Plastic apron * *if needed	● Family members / next of kin are strictly prohibited from touching or kissing the body ● Only 2 family members / next of kin are allowed to view the body for identification Family members / next of kin should stand at a minimum distance of 1 meter from the body
Burial / cremation site	HCW / Religious body handlers	Disposal of body ● Transporting body to burial site/ cremation ● Burial / cremation	● Well fitted surgical mask ● Isolation gown (fluid repellent long sleeved gown) ● Gloves ● Boots/footwear protection	According to Public Health SOP.
Autopsy room / Mortuary / Hearse	HCW / Religious body handlers	Cleaning and decontamination procedure	● Well fitted surgical mask/ N95 mask based on risk assessment ● Isolation gown (fluid-repellent long-sleeved gown / apron) ● Gloves ● Rubber boots ** adhere to OSH attire requirement when handling the chemical*	

E. MANAGEMENT OF POST-MORTEM SPECIMENS IN CASES WITH SUSPECTED OR CONFIRMED MERS INFECTION

	TEST	SPECIMEN	CONTAINER	RECOMMENDED PACKAGING / STORAGE TEMPERATURE
A.	**JABATAN KIMIA MALAYSIA (JKM)**			
1.	Toxicology analysis	Blood, Urine	Universal bottle	*Triple layer packaging
		Tissue (Liver etc)	Sterile container	
2.	Deoxyribonucleic acid (DNA) analysis	Blood	FTA card	**Put into a biohazard plastic bag, seal it and put into an envelope. Label the envelope with deceased's details and a biohazard mark.
		Bone, Tissue	Sterile container	*Triple layer packaging
3.	Forensic analysis	Hair, fingernails	Sterile container	*Triple layer packaging
		Clothing	Paper/envelope and then put into a plastic package.	Disinfect plastic package with 0.5% sodium hypochlorite.
		Swabs	Sterile container	*Triple layer packaging
		Gunshot residue	Gunshot residue (GSR) collection kit	***Place in 2 biohazard plastic bags.
4.	Others	Others	Respective containers	Depending on containers.

B.	**DEPT OF PATHOLOGY/INSTITUTE FOR MEDICAL RESEARCH**			
1.	PCR MERS	Nasopharyngeal swab (NPS)/Oropharyngeal swab (OPS)	Viral transport media (VTM)	***Triple layer packaging 2-8° C if ≤ 5 days -70° C (dry ice) if > 5 days
		Tissue samples	VTM/Sterile container	***Triple layer packaging 2-8° C if ≤ 24 days -70° C (dry ice) if > 24days
2.	Histopathology	Airways, lungs, other organs	Cassettes in formalin-containing container (sample:10% neutral buffered formalin ratio = 1:10)	Standard packaging (Refer "**WORKFLOW GUIDELINE II**")
3.	Serology (Dengue, Leptospirosis, Melioidosis, Hep B/C, HIV etc)	Blood	Plain tube with gel (yellow cap)	***Place in 2 biohazard plastic bags and put inside a cooler box. Place form at the outer layer of the box. (Follow respective local pathology laboratory guidelines)
4.	Cultures	Blood	Bactec bottle	
		CSF	Bijou bottle	
		Swab	Amies/Stuart Transport Medium	
		Tissue, Urine, Fluid	Sterile container	
5.	PCR for various infectious agents (Dengue, Leptospirosis etc)	Tissue (Liver, spleen, kidney etc)	Sterile container	

6.	PCR for other respiratory pathogens	Tracheal swab	VTM	*Triple layer packaging
		Lung swab	VTM	
		Lung tissue	Sterile container	
7.	Inborn error of metabolism	Blood	Lithium-heparin tube, EDTA tube	*Triple layer packaging
			Whatman filter paper	**Put into a biohazard plastic bag, seal it and put into an envelope. Label the envelope with deceased's details and a biohazard mark.
		Urine	Sterile container	*Triple layer packaging
8.	Entomology	Maggots	Sterile container containing 70% alcohol	***Place in 2 biohazard plastic bags.
C.	**DEPTs OF FORENSIC MEDICINE**			
1.	Diatom analysis	Tissues (limited to lung and another organ)	Formalin-containing container	*Triple layer packaging
2.	Histopathology	HPE slides/Paraffin-embedded tissue blocks	Appropriate container	Standard packaging

* Triple layer packaging
- 1st layer: Container & disinfect outer part
- 2nd layer: Biohazard/JKM plastic bag
- 3rd layer: Outer container

I. WORKFLOW GUIDELINE: Specimens to JKM, Pathology, IMR and Forensic Medicine laboratories

1) Pre-sampling

- Liaise with microbiologist/virologist/pathologist, respective subspecialty forensic pathologist, infectious disease (ID) physician, toxicologist/chemist etc where necessary (depending on cases).
- Liaise first with laboratory that performs the analysis where necessary i.e: respective laboratory in JKM, histopathology unit / pathology laboratory in respective state, diatom laboratory etc.
- Prepare for sampling procedure
    - Appropriate personal protective equipment (PPE) for task
    - Tools/equipment for sampling
    - Packaging sets for transportation of samples
    - Specimen handling area
    - Biohazard waste bin
    - Sampling team & Specimen handling team
    - Respective laboratory request forms
    - Fill in all details in the request form beforehand and mark ‘Biohazard specimen’ at the front page.

2) During sampling

- Perform sampling. Put in appropriate container (first layer packaging).
- Seal cover with parafilm (2 layers).
- Spray with disinfectant (10% sodium hypochlorite).
- Handover specimen to handling team.

3) Specimen handling area

- Spray with disinfectant (10% sodium hypochlorite).
- Wrap with gauze and tie it with a rubber band.
- Put in another container/biohazard plastic bag (second layer packaging).
- Put in multipurpose container “*bekas serbaguna*” (third layer packaging).

- Disinfect its outer layer using universal wipes or disinfectant spray.
- Put in polystyrene box containing ice pack. Seal its cover with tape.
- Label at the outer part, indicating BIOHAZARD specimens.
- Disinfect outer layer of box using universal wipes or disinfectant spray.
- Send to the respective laboratories.

II. WORKFLOW GUIDELINE: Histopathology specimens to Pathology and Forensic Histopathology laboratories

1) Pre-sampling

- Liaise with microbiologist/virologist/pathologist, respective subspeciality forensic pathologist, infectious disease (ID) physician, toxicologist/chemist etc. where necessary (depending on cases).
- Liaise first with laboratory that performs the analysis where necessary i.e: respective laboratory in JKM, histopathology unit / pathology laboratory in respective state, diatom laboratory etc.
- Prepare for sampling procedure
    - Appropriate PPE for task
    - Tools/equipment for sampling
    - Packaging sets for transportation of samples
    - Specimen handling area
    - Biohazard waste bin
    - Sampling team & Specimen handling team
    - Respective laboratory request forms
    - Fill in all details in the request form beforehand and mark ‘Biohazard specimen’ at the front page.

2) During sampling

- Perform sampling. Cut tissue block specimens (with a length, width and height of 3 - 5 cm) for conventional paraffin embedding, and immediately put into the slide cassette.
- Transfer into container with 10% formalin solution for fixation. Spray outer container with 0.5% sodium hypochlorite.
- Hand over specimen to handling team.

- **NB** : Auxiliary examination below, if needed to be done, shall follow the appropriate handling of the specimens before taking routine histopathology samples.
    - Hematoxylin-eosin staining.
    - Special staining.
    - Immunohistochemical staining.
    - Immunofluorescence staining.
    - Virus isolation and gene sequencing of secretion and tissue blocks.
    - In situ detection of viral RNA or viral protein antigens in tissue sections.
    - Ultrastructural examination of tissue sections.
    - Detection of virus particle.

3) Specimen handling area

- Spray outer container with 0.5% sodium hypochlorite.
- Keep specimen fixed in 10% formalin solution for 48 -72 hours.
- Send the specimen to respective laboratory for processing.

IMPORTANT NOTES

1. The above guideline, particularly the packaging of specimens, shall be in tandem with each state's respective Pathology departments SOP for MERS specimens.

2. The decision on post-mortem specimens shall be made on case-by-case basis and is not limited to the list in the guideline. The list is not comprehensive and may change in line with evolving information and knowledge of MERS infection.

3. Communicate with the respective laboratories or referral centre before sampling or autopsy as part of pre-autopsy planning.

4. Cases for autopsy in MERS infected bodies are rare. If it does happen mostly brought in dead (BIDs) with scarce or no information available hence, it is justifiable for various specimens to be sent for investigations.

5. For histopathology specimens, avoid frozen sections and grossing partially fixed specimens, if possible.

6. Prolonged formalin fixation (more than 2 weeks) of histopathology specimens may interfere with some immunohistochemical and molecular diagnostic assays.

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LABORATORY BIOSAFETY GUIDELINES FOR HANDLING AND PROCESSING SPECIMENS

General Guidelines (for working with potentially infectious materials)

1. All laboratories should perform a site-specific and activity-specific risk assessment to identify and mitigate risks. Risk assessments and mitigation measures are dependent on:
   - The procedures performed;
   - Identification of the hazards involved in the process and/or procedures;
   - The competency level of the personnel who perform the procedures;
   - The laboratory equipment and facility;
   - The resources available.

2. Follow Standard Precautions when handling clinical specimens, all of which may contain potentially infectious materials. Standard Precautions include hand hygiene and the use of personal protective equipment (PPE), such as laboratory coats or gowns, gloves, and eye protection.

3. Follow routine laboratory practices and procedures for decontamination of work surfaces and management of laboratory waste.

4. Any procedure with the potential to generate fine-particulate aerosols (e.g., vortex or sonication of specimens in an open tube) should be performed in a Class II Biological Safety Cabinet (BSC). Appropriate physical containment devices (e.g., centrifuge safety buckets; sealed rotors) should be used for centrifugation.

   Use parafilm to seal the tubes first, and put into centrifuge cups and seal tightly before putting into the centrifuge. Wait after 15 minutes before opening the centrifuge.

   Ideally, rotors and buckets should be loaded and unloaded in a BSC. Perform any procedures outside a BSC in a manner that minimizes the risk of exposure to an inadvertent sample release.

5. After specimens are processed, decontaminate work surfaces and equipment and transportation box with appropriate disinfectants. Use any EPA-registered hospital disinfectant. Follow manufacturer’s recommendations for use-dilution (i.e., concentration), contact time, and care in handling.

6. All disposable waste should be put into appropriate biohazard bag and sealed to be autoclaved or incinerated.

A. The following activities may be performed in BSL-2 facilities using standard BSL- 2 work practices: (Normal practice)

1. Pathologic examination and processing of formalin-fixed or otherwise inactivated tissues **(HPE);**

2. Molecular analysis of extracted nucleic acid **preparations (PCR mastermix, put into thermocycler);**

3. Electron microscopic studies with glutaraldehyde-fixed grids;

4. Routine examination of bacterial and mycotic cultures **(Reading plates);**

5. Routine staining and microscopic analysis of fixed smears **(Staining and reading BFMP, FBP);**

6. Final packaging of specimens for transport to diagnostic laboratories for additional testing. Specimens should already be in a sealed, decontaminated primary container;

7. Inactivated specimens (e.g., specimens in nucleic acid extraction buffer/heat block)

B. The following activities involving manipulation of potentially infected specimens should be performed as above and in a Class II BSC:

1. **Aliquot and/or diluting** specimens;

2. **Inoculating** bacterial or mycological culture media (Sample processing) **PLEASE PROCESS POSITIVE BLOOD CULTURES AND ANY SAMPLE IN THE BSC (for Suspected cases);**

3. Performing diagnostic tests that do not involve propagation of viral agents in vitro or in vivo;

4. **Nucleic acid extraction** procedures involving potentially infected specimens;

5. **Preparation and chemical- or heat-fixing of smears** for microscopic analysis. ie: AFB Smear.

C. Virus Isolation

Virus isolation in cell culture and initial characterization of viral agents recovered in cultures of the specimens should only be conducted in a Biosafety Level 3 (BSL-3) laboratory using BSL-3 practices. Site- and activity-specific biosafety risk assessments should be performed to determine if additional biosafety precautions are warranted based on situational needs.

SPECIMEN COLLECTION, TRANSPORTATION AND STORAGE

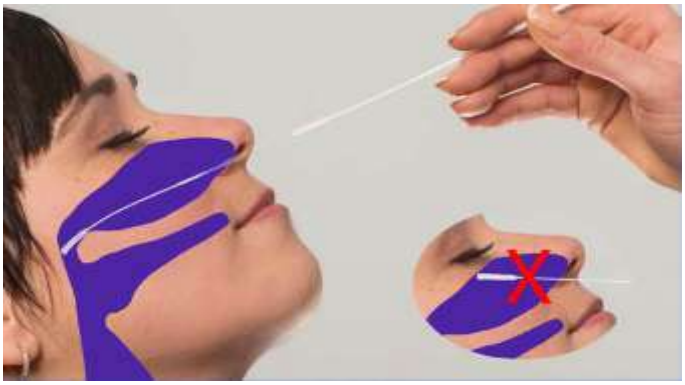
1.1 Personnel taking the samples

The personnel taking the samples must be well-trained and authorized.

1.2 Technique for specimen collection

1.2.1 Nasopharyngeal Swab (NPS)

- Explain the procedure to patient
- Bend the patient´s head backward.
- Swiftly insert the swab into the nostril. The depth of insertion is around 4-8 cm for children and 8-12 cm for adults.
- Rotate the swab against the nasopharyngeal mucosa and remove the swab.



1.2.2 Oropharyngeal Swab (OPS)

- Ask the patient to open his or her mouth
- Depress the tongue using tongue depressor
- Swab the posterior pharynx behind the tonsils
- Avoid the tonsils

1.2.3 Nasopharyngeal aspirate/ secretion

- Insert a small catheter through the nares to the back of nose.
- Gently suction as the catheter is withdrawn slowly.
- Collect in sterile screw capped container.
- Ensure that the container is sealed securely to prevent leakage.

1.2.4 Sputum collection

- Collect early morning specimen after rinsing the mouth and gargling with water.
- Instruct the patient to cough deeply and expectorate only sputum and not saliva into the sterile screw-cap container.

1.2.5 Other respiratory specimens

Other specimens that can be sent are Bronchoalveolar lavage, lung tissue or pleural fluid.

1.2.6 Blood collection

- Blood shall be collected by phlebotomist, using aseptic technique.
- Blood collected is only for serology surveillance and research purposes.

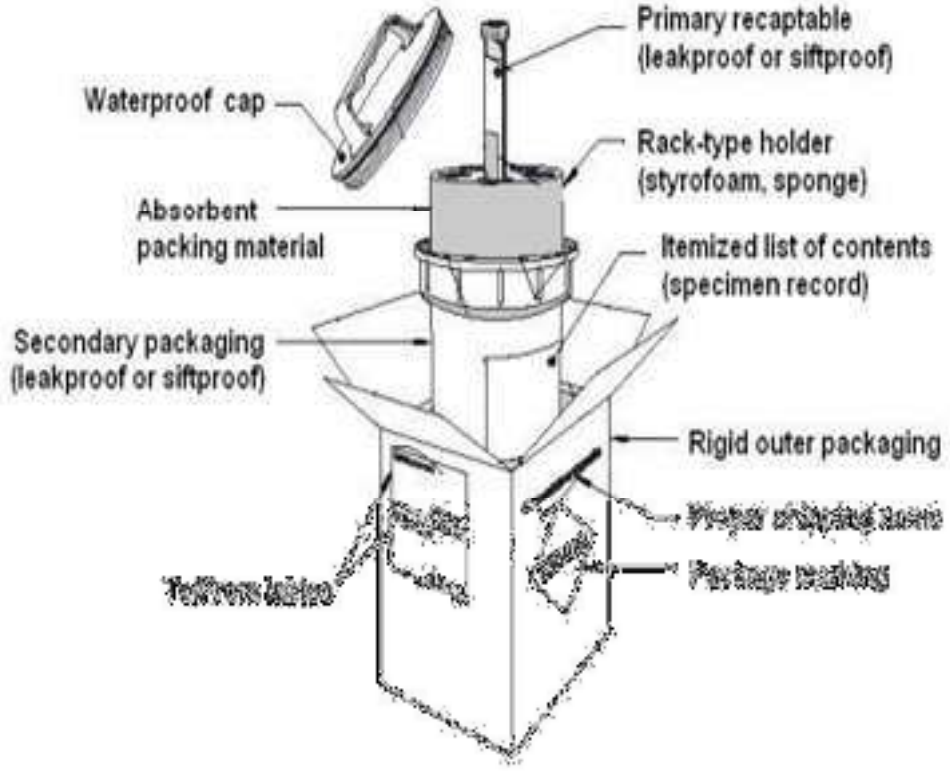
2.0 SPECIMEN PACKAGING AND TRANSPORTATION

2.1 Type Of Transport Media And Containers

Specimen	Container/ Transport Media	Storage
OPS	**Both swab put in 1 VTM** 	If transportation of samples is within 72 hours, store at 2- 8°C and transport in ice
NPS		

Sputum/ Sterile fluid	**Sterile Container**  	
NPA/ Sterile fluid	**Falcon tube** 	
Blood	**Plain Tube** 	**store at 2- 8°C**

2.2 Triple Layer Packaging



SOP for Transport of Biological Specimens in Malaysia 2012: category B (UN3373)

1. Leakproof and siftproof primary container.

2. Secondary packaging- leakproof and waterproof container with absorbent material.

3. Tertiary/ outer shipping box, rigid to protect specimens during shipment

Note:

- Follow the proper triple packing guidelines especially when packing highly infectious substances/samples to ensure safe transportation

- For airline shipment, please follow the International Air Transport Association (IATA) requirement

2.2.1 Packaging for bigger quantity of samples.

- Each sample shall be placed in an individual biohazard plastic bag (secondary packaging).
- Secondary packaging can be grouped into 1 bigger plastic bag, not more than 20 samples each.
- The big packaging must be coded according to the name list to facilitate identification of the samples.
- The forms must be placed into plastic bag/envelope and placed on top of the outer box.

2.3 Specimen Shipping And Transportation

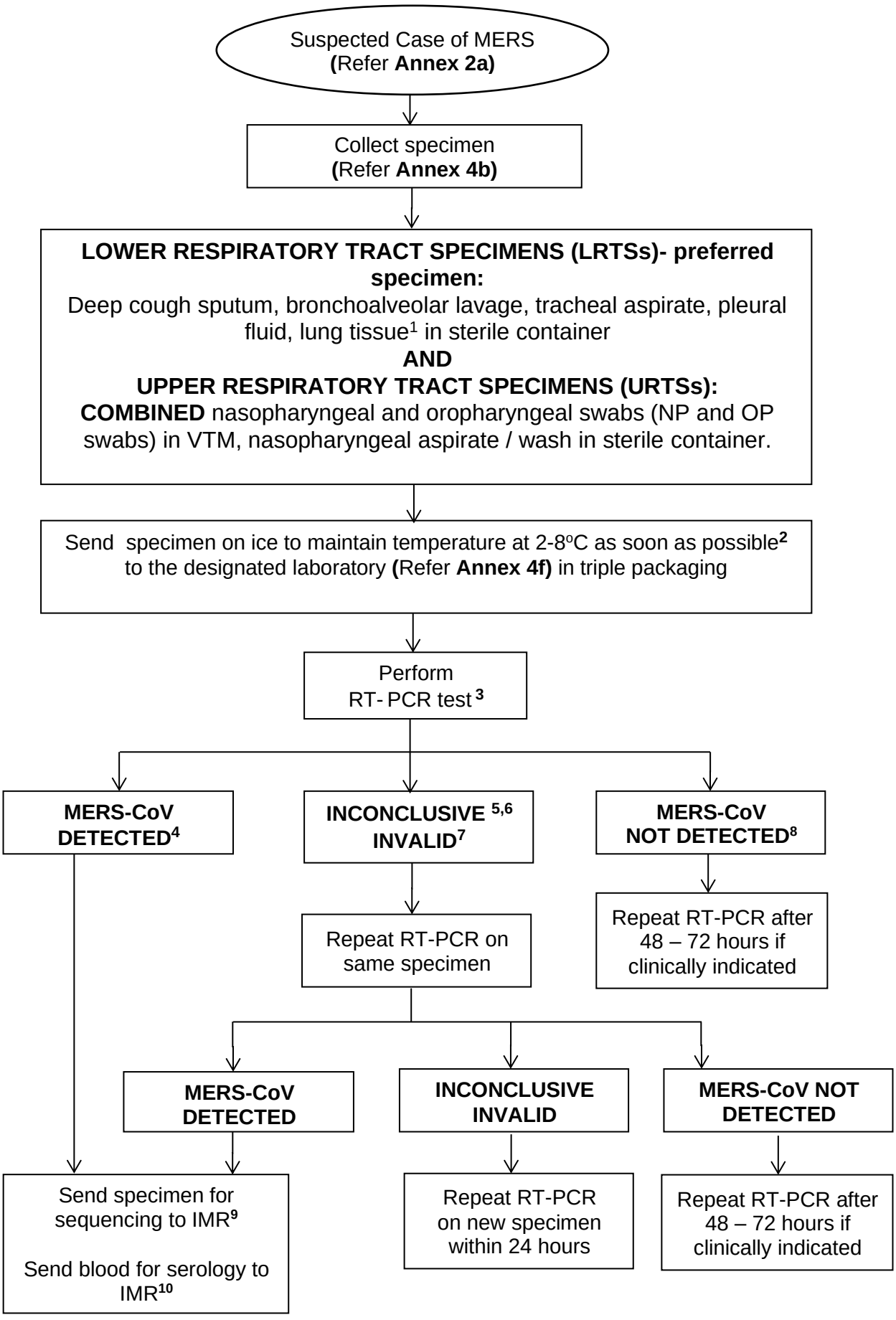
Specimens should be shipped **at 2-8ºC** with ice packs. The primary container and the secondary packaging should maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost. Packages containing dry ice should be designed and constructed so as to prevent the build-up of pressure and to allow the release of gas that could rupture the packaging.

For transporting human specimens by air, it must be handled by trained personnel and to follow UN 3373 Biological Substance, Category B International Air Transport Association (IATA) Dangerous Goods Regulations (DGR) and SOP for Transport of Biological Specimens in Malaysia 2012.

Ensure the outer package has been properly marked and labelled with the following:

- Hazard labelled with UN Identification Number– UN 3373
- Biological Substance, Category B
- Shipper's name, address, and phone number
- Receiver's name, address, and phone number
- Name and phone number of a responsible person is optional if it is on the airway bill.

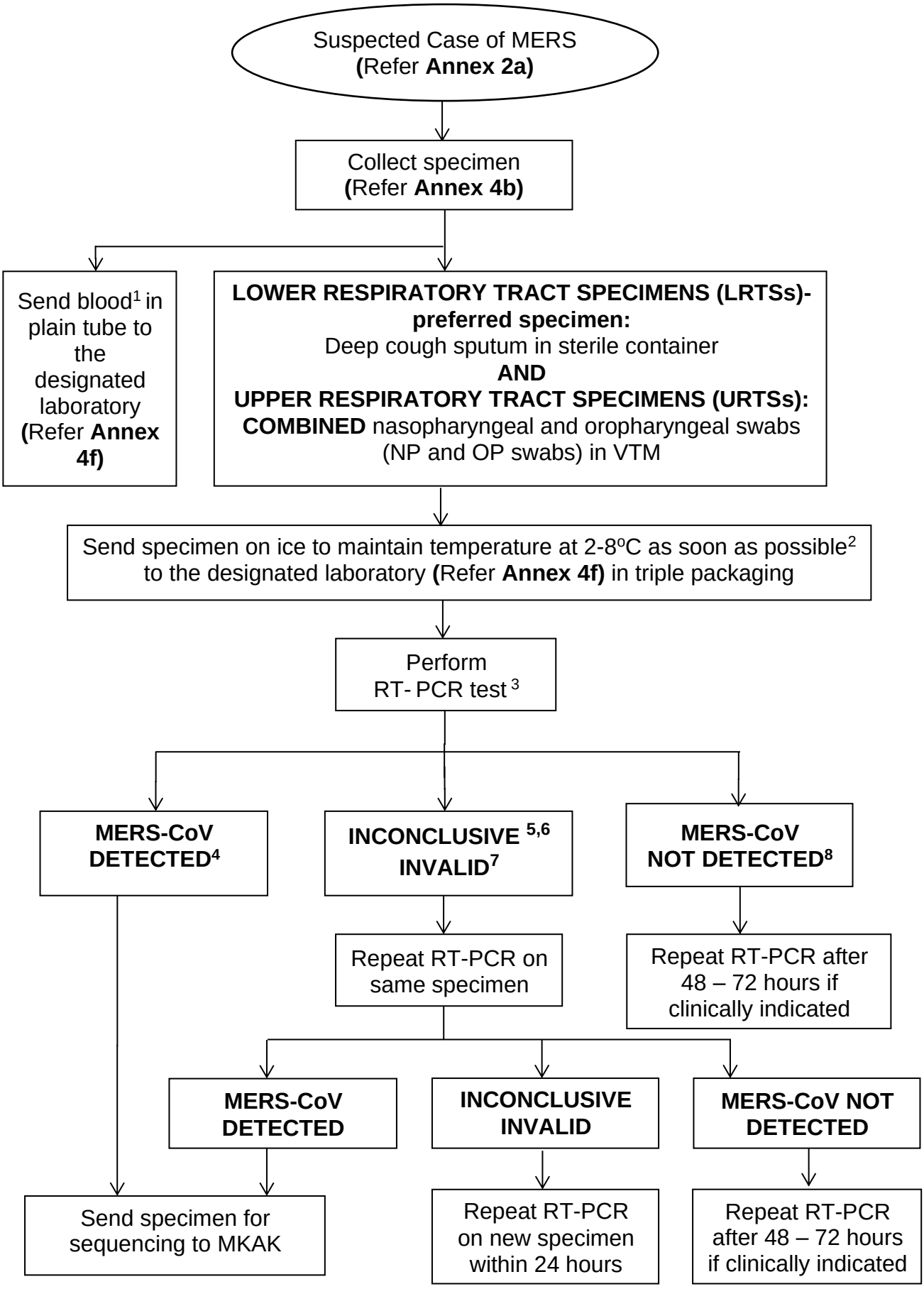
Flow Chart for Laboratory Diagnosis of MERS-CoV using Real-Time Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) for Suspected Case of MERS In Hospital



NOTE:

1. Selected tissues from post mortem cases. Send specimens to IMR, National Institute of Health (NIH).
2. If transportation of sample is within 72 hours, store at 2-8°C. If transportation of sample is after 72 hours, store at - 80°C.
3. Use Medical Device Authority(MDA) approved RT-PCR kit . The assay shall have minimum of 2 different targets on MERS-CoV genome, of which at least one target confirmatory for MERS-CoV (following the recommendations and updates by WHO from time to time).
4. A positive laboratory result must be interpreted taking into consideration the clinical history, presentation and/or post mortem findings.
5. Inconclusive – only one target gene is detected.
6. For post mortem cases, inconclusive result need to be interpreted on case to case basis.
7. Invalid- Internal control of the results is not detected.
8. The negative result does not conclusively rule out MERS-CoV as the causative agent of the disease for the following reason:
    a. Specimens were not collected at the time when the virus present
    b. Specimens were not collected, stored or transported in a proper manner.
9. For sequencing, samples from hospitals to be sent to IMR.
10. For positive case, to send 5 mls blood in plain tube for immediately (first serum) and after 7-14 days (second serum) to IMR.

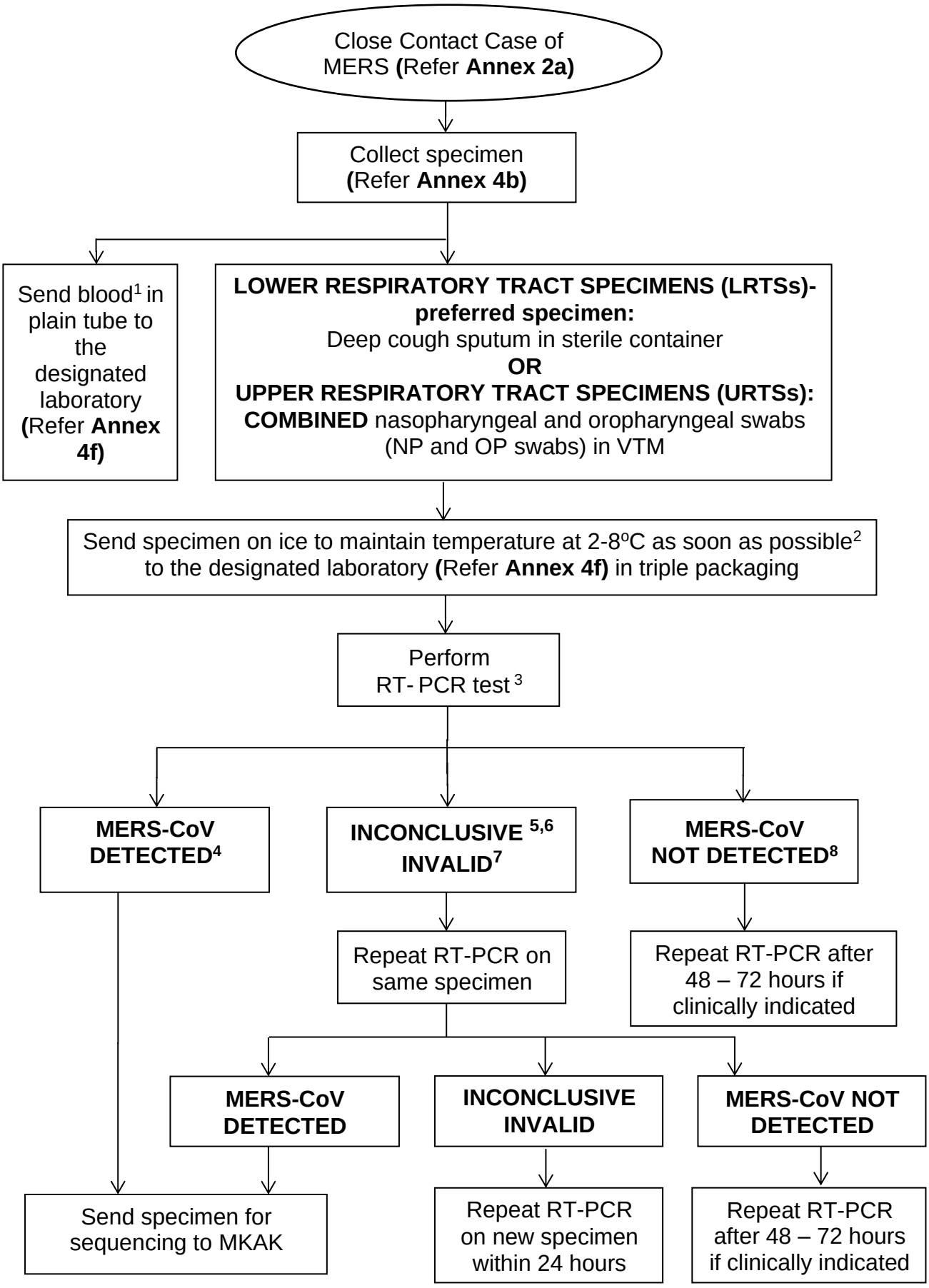
Flow Chart for Laboratory Diagnosis of MERS-CoV using RT-PCR in Suspected Case of MERS In Public Health Clinic



NOTE:

1. 5 mls blood in plain tube immediately (first serum) and after 7-14 days (second serum).
2. If transportation of sample is within 72 hours, store at 2-8°C. If transportation of sample is after 72 hours, store at - 80°C.
3. Use Medical Device Authority(MDA) approved RT-PCR kit . The assay shall have minimum of 2 different targets on MERS-CoV genome, of which at least one target confirmatory for MERS-CoV (following the recommendations and updates by WHO from time to time).
4. A positive laboratory result must be interpreted taking into consideration the clinical history, presentation and/or post mortem findings.
5. Inconclusive – only one target gene is detected.
6. For post mortem cases, inconclusive result need to be interpreted on case to case basis.
7. Invalid- Internal control of the results is not detected.
8. The negative result does not conclusively rule out MERS-CoV as the causative agent of the disease for the following reason:
    a. Specimens were not collected at the time when the virus present
    b. Specimens were not collected, stored or transported in a proper manner

Flow Chart for Laboratory Diagnosis of MERS-CoV in Close Contacts to A Confirmed Case of MERS



NOTE:

1. 5 mls blood in plain tube immediately (first serum) and after 7-14 days (second serum).
2. If transportation of sample is within 72 hours, store at 2-8°C. If transportation of sample is after 72 hours, store at - 80°C.
3. Use Medical Device Authority(MDA) approved RT-PCR kit . The assay shall have minimum of 2 different targets on MERS-CoV genome, of which at least one target confirmatory for MERS-CoV (following the recommendations and updates by WHO from time to time).
4. A positive laboratory result must be interpreted taking into consideration the clinical history, presentation and/or post mortem findings.
5. Inconclusive – only one target gene is detected.
6. For post mortem cases, inconclusive result need to be interpreted on case to case basis.
7. Invalid- Internal control of the results is not detected.
8. The negative result does not conclusively rule out MERS-CoV as the causative agent of the disease for the following reason:
    a. Specimens were not collected at the time when the virus present
    b. Specimens were not collected, stored or transported in a proper manner

Makmal* Yang Mengendalikan Sampel MERS
Mengikut Lokasi Fasiliti Yang Menghantar

(A) SAMPEL (UJIAN PCR) MERS-CoV DARI HOSPITAL KERAJAAN ATAU SWASTA		
Bil.	**Lokasi Fasiliti Yang Menghantar Sampel**	**Makmal Yang Mengendalikan Sampel**
HOSPITAL KERAJAAN		
1.	Perlis	Hospital Sultanah Bahiyah, Alor Setar, Kedah
2.	Kedah	Hospital Sultanah Bahiyah, Alor Setar, Kedah Hospital Sultanah Maliha, Langkawi, Kedah
3.	Pulau Pinang	Hospital Pulau Pinang
4.	Perak	Hospital Raja Permaisuri Bainun, Ipoh, Perak
5.	Selangor	Hospital Sungai Buloh, Selangor
6.	WP Kuala Lumpur & Putrajaya	Hospital Kuala Lumpur
7.	Negeri Sembilan	Hospital Tuanku Jaafar, Seremban, N. Sembilan
8.	Melaka	Hospital Melaka
9.	Johor	Hospital Sultanah Aminah, Johor Bahru, Johor
10.	Pahang	Hospital Tengku Ampuan Afzan, Kuantan, Pahang
11.	Terengganu	Hospital Sultanah Nur Zahirah, Kuala Terengganu, Terengganu
12.	Kelantan	Hospital Raja Perempuan Zainab II, Kota Bharu, Kelantan
13.	Sarawak	Hospital Umum Kuching, Sarawak
14.	Sabah	Makmal Kesihatan Awam, Kota Kinabalu, Sabah
15.	WP Labuan	Makmal Kesihatan Awam, Kota Kinabalu, Sabah
FASILITI KESIHATAN SWASTA		
16.	Seluruh negara	Geneflux Diagnostics Sdn. Bhd., Menara KLH, Bandar Puchong Jaya, Selangor No Tel: 03-80768154 No Fax: 03-80703654 Lablink (M) Sdn. Bhd. Bangunan Lablink, 14 (129) Jalan Pahang Barat Off Jalan Pahang, 53000 Kuala Lumpur No Tel: 03-40234588 / 40233588 No Fax:03-40234298 Email: nazri@kpjlablink.com Pantai Premier Pathology Sdn. Bhd. 1st Floor, Medical Office Block (MOB), Pantai Hospital Ampang, Jalan Perubatan 3,

		55100, Kuala Lumpur. No Tel: 03-42809115 Fax: 03-42964095 Email: info@premierpathology.com.my Neogenix Laboratoire Sdn Bhd C707, Level 7, Block C, Kelana Square, 17, Jalan SS7/26, Kelana Jaya, 47301 Petaling Jaya, Selangor, Malaysia No Tel: 03-7621 2154 Email : info@neogenix.org/ yew@neogenix.org Oncode Scientific Sdn. Bhd. Lot 03-01, 3rd Floor, Hap Seng Business Park, Unity Square, Seksyen 23, 40300 Shah Alam, Selangor Darul Ehsan Malaysia No Tek: +603 3310 0819 (General Line) / 016-310 1356 (Amy) Email: amy.teh@oncodesc.com

(B) SAMPEL (UJIAN PCR) MERS-CoV DARI KLINIK KESIHATAN / PKD (TERMASUK KONTAK RAPAT DAN ANGGOTA KESIHATAN YANG DIKESAN MELALUI AKTIVITI ACD DI LAPANGAN)		
17.	Selangor, Wilayah Persekutuan dan Putrajaya, Negeri Sembilan, Melaka, Pahang	Makmal Kesihatan Awam Kebangsaan (MKAK) Sg. Buloh, Selangor
18	Perlis, Kedah, Perak, Pulau Pinang	Makmal Kesihatan Awam Ipoh,Perak
19	Johor	Makmal Kesihatan Awam Johor Bharu, Johor
20	Kelantan,Terengganu	Makmal Kesihatan Awam Kota Bharu, Kelantan
21.	Sabah dan WP Labuan	Makmal Kesihatan Awam Kota Kinabalu, Sabah
22	Sarawak	Hospital Umum Sarawak
(C) SAMPEL SERUM DAN SAMPEL SEQUENCING BAGI KES YANG DISAHKAN MERS-CoV		
23.	Seluruh negara	Unit Virologi, Institut Penyelidikan Perubatan (IMR), Kuala Lumpur
(D) SAMPLE SERUM DAN SAMPEL SEQUENCING BAGI KONTAK RAPAT		
24	Seluruh negara	Makmal Kesihatan Awam Kebangsaan (MKAK) Sg. Buloh, Selangor

***Makmal yang menawarkan ujian RT-PCR perlu menyertai Penilaian Kualiti Luaran (EQA) MERS-CoV**

PUBLIC HEALTH PREPAREDNESS AND RESPONSE

CONFIRMED MERS-CoV INFECTION: FLOW CHART FOR FIELD RESPONSE ACTIVITIES

The Respective District Health Office (PKD)

1. Activation of the District Operations Room
2. Establishment of Rapid Assessment Team (RAT) and Rapid Response Team (RRT).
3. To compile, update and analyze the data / information received from the field response activities.
4. To submit reports to JKN:
   - **DAILY** report: on daily basis (i.e. by 10:00 am) throughout **two (2) incubation period** from the date of the last laboratory-confirmed MERS case.
   - **FINAL** report: to be submitted **after completion of two (2) incubation period** from the date of the last laboratory-confirmed MERS case.
5. The team of RAT & RRT;
   - Consistently apply appropriate infection prevention and control measures (refer **Annex 3f**)
   - To conduct field investigations using **Annex 5e**.
   - Refer **Annex 5b** for management of close contacts. Monitor the symptoms using the format as described in **Annex 5g/ 5h (HAMT)**.
   - To input the findings obtained into the database (refer **Annex 5f**)
   - For close contact of confirm positive case, to send
     i. Combined NPS & OPS in VTM and 5 mls blood in plain tube immediately
     ii. Second sample (NPS/OPS and blood) D10 of HSO
   - To trace results and update the database.
   - Risk Communication activities.

The Respective State Health Department (JKN)

1. To verify and validate the information received.
2. To submit reports to the National CPRC:
   - DAILY report on daily basis (i.e. by 12:00 noon) throughout **two (2) incubation period** from the date of the last laboratory-confirmed MERS case.
   - **FINAL** report: to be submitted **after completion of two (2) incubation period** from the date of the last laboratory-confirmed MERS case.
3. Risk Communication activities.

The National Public Health Laboratory (NHPL) Sg. Buloh, Selangor/ Regional Public Health Laboratory

1. Management of the specimens collected from field investigations.
2. To inform the following regarding the lab result obtained:
   - The requester (clinic/hospital)
   - The respective PKD, JKN and National CPRC
3. If **positive** result was obtained from any of the samples:
   - **IMMEDIATE** dissemination of the result to the respective PKD, JKN and the National CPRC
4. Input of the result obtain in database.
5. Consistently apply appropriate infectious prevention and control measures (refer **Annex 3f**).
6. To monitor health status of the relevant personnel using the monitoring format as described in **Annex 5c.**
7. Refer **Annex 5b** for management of the laboratory personnel who were handling the relevant specimens while not wearing the recommended personal protective equipment (PPE).
8. To submit **DAILY** reports to National CPRC (i.e. by 9.00 am) from the first day of handling specimens related to the event until 14 days after the last exposure to similar specimens, mainly reporting on the health personnel involved.

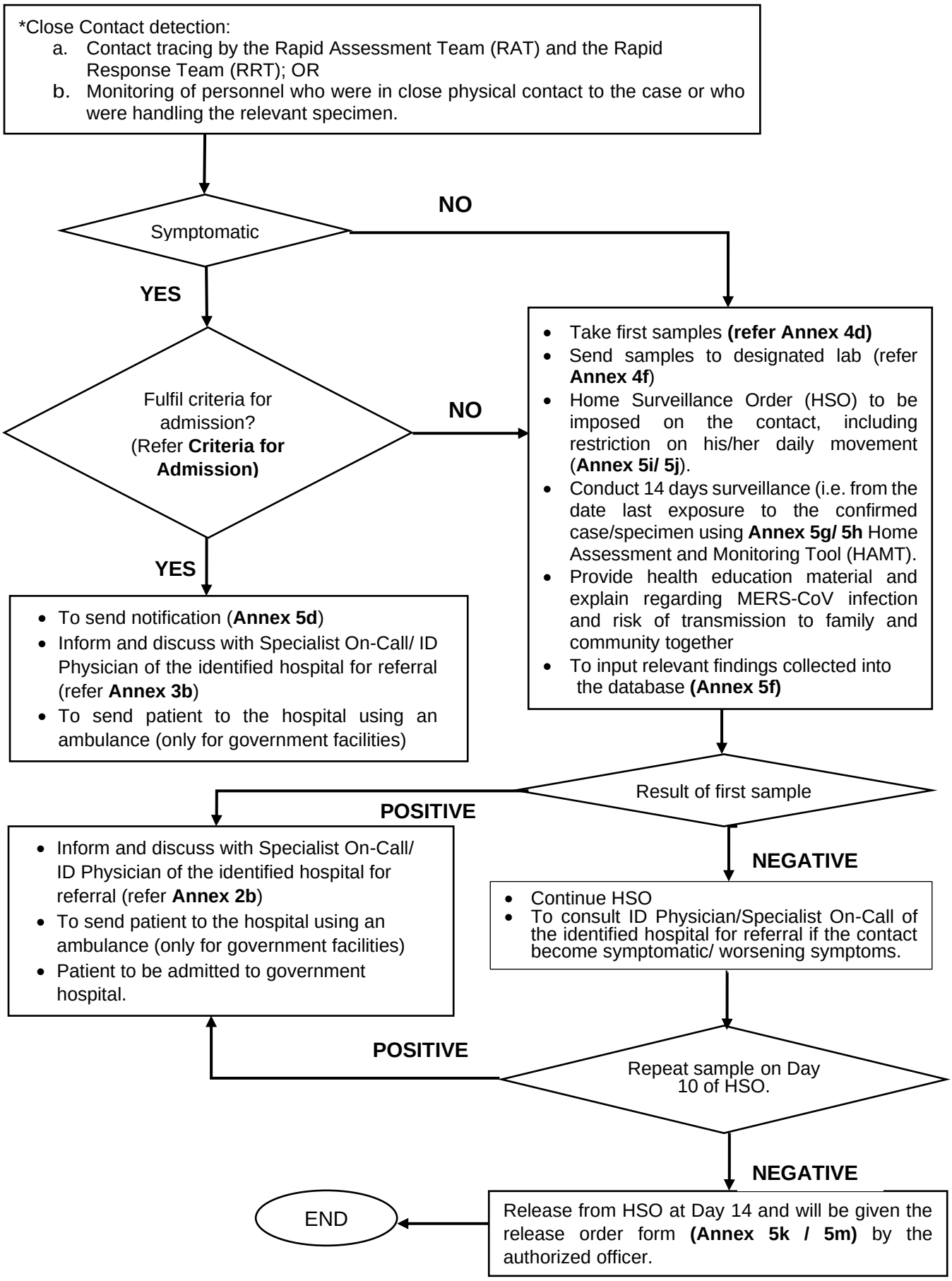
The National Crisis Preparedness and Response Center (CPRC)

1. To verify and validate the information received
2. To notify Malaysia National IHR Focal Point (NFP) for further action.
3. If needed, to involve **OTHER** JKN for contact tracing activity.
4. To co-ordinate the logistic matters.
5. To conduct and monitor the prevention and control activities centrally.
6. Risk Communication activities.

The Infection Prevention & Control Team/ The Public Health Unit (of the respective healthcare facilities)

1. Consistently apply appropriate infectious prevention and control measures (refer **Annex 3f**)
2. To monitor health status of the relevant health personnel using the monitoring format as described in **Annex 5c**.
3. Refer **Annex 5b** for management of personnel who provided care/ handles the relevant specimens while not wearing the recommended PPE.
4. To input the findings obtained in database (refer **Annex 5f**)
5. To submit **DAILY** reports to PKD (i.e. by 9.00 am) **throughout two (2) incubation period** from the date of the last laboratory-confirmed MERS case, mainly reporting on the status of the personnel.
6. The specimens taken from the personnel, to be sent to NHPL Sg. Buloh/ Regional Public Health Laboratory, respectively.
7. To trace results and update database

RESPONDING TO MERS OUTBREAK:
Management of Close Contacts to A Confirmed Case of MERS



Criteria for Admission

1. Not all suspects of MERS require admission.

2. Viral loads of confirmed MERS patients are at their highest (most infective) in those with severe illness, usually during the second week of the disease.

3. Decision for admission is based on the severity assessment of the patient by the primary care/ Family Medicine Specialist/ ID Physician.

4. Those who meet the case definition close contact to a confirmed case of MERS with ANY signs of severe illness (but are not limited to) the following:
    i. Fever more than 2 days
    ii. SpO_2 less than 95%
    iii. Respiratory rate >25/min
    iv. Angina chest pain
    v. Unable to tolerate orally
    vi. Unable to ambulate without assistance
    vii. Reduced level of consciousness

*** Definition Of Close Contact**

a) Anyone who provided care for the patient, including a health care worker (while not wearing the recommended personal protective equipment) or family member, who had other similarly close physical contact;
b) Anyone who stayed at the same place (e.g. lived with, visited) as a probable or confirmed case while the case was ill; or
c) Laboratory personnel who were handling the relevant specimens of a probable or confirmed case (while not wearing recommended personal protective equipment).

MANAGEMENT OF HEALTHCARE WORKERS (HCW) DURING MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS (MERS-COV) INFECTION

Healthcare workers (HCW) play a vital role in management of the MERS-CoV infection such as testing, patient care, field investigations, data management, administrative measures etc. Patient care involves management of cases in the health clinics, and hospitals. In healthcare settings, there have been both smaller and bigger outbreaks of infections, particularly when infection prevention and control procedures were not effectively implemented.

Thus, it is essential to implement infection prevention and control measures to prevent the potential spread of MERS-CoV in healthcare facilities and institutions that offer treatment for patients with MERS-CoV infection in order to reduce the risk of the virus spreading from an infected patient to other patients, medical personnel, or outsiders. Infection prevention and control education and training should be provided to healthcare staff, who should also update their knowledge in this area.

A. PREVENTION OF MERS-CoV TRANSMISSION IN HEALTHCARE FACILITIES

Utilization of infection control methods and protocols, including engineering controls, environmental controls, administrative controls, safer work practices, and personal protective equipment (PPE), is necessary to prevent the spread of respiratory diseases, including MERS-CoV, in health facilities. These principles apply to all MOH facilities and may also be used by non-MOH medical and health facilities as outlined in Annex 3f: Guidelines On Infection Prevention And Control (IPC) Measures In Managing Suspected, Probable Or Confirmed Middle East Respiratory Syndrome Coronavirus (MERS) Infection.

B. MANAGEMENT OF HCW SUSPECTED/ PROBABLE/ CONFIRMED MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS (MERS-CoV) INFECTION

The management of HCW with Suspected / Probable / Confirmed Middle East Respiratory Syndrome Coronavirus (MERS-CoV) Infection will be similar to the management of the general public with the infection. The management flows can be referred to as in Annex 3e.

1. A HCW is deemed to have been in **Close Physical Contact** due to:
    i. Health care associated exposure, including providing direct care for MERS-CoV patients, working with health care workers infected with MERS-CoV, visiting patients or staying in the same close environment of a MERS-CoV patient without the appropriate PPE.

ii. Working together in close proximity or sharing the same classroom environment with a MERS-CoV patient;
iii. Traveling together with MERS-CoV patient in any kind of conveyance;
iv. Living in the same household as a MERS-CoV patient.

(Refer Annex 2a: Middle East Respiratory Syndrome (MERS) Case Definition)

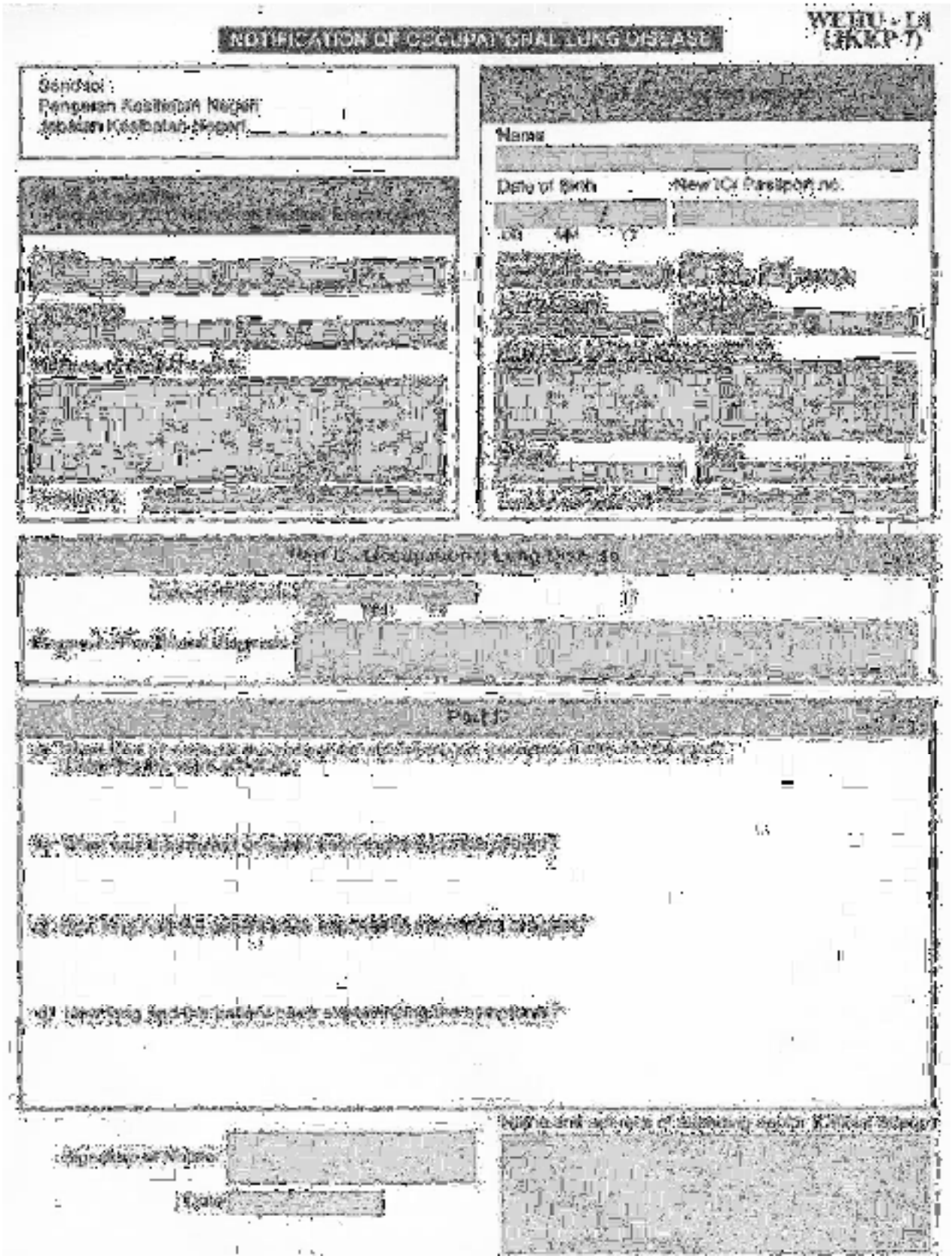
2. For a HCW in **Close Physical Contact** with a patient, the quarantine period will be **14 days** from the date of exposure. HCW that are under the quarantine period will be provided with:
    i. Home Surveillance Order (Annex 5i/ 5j)
    ii. Home Assessment & Monitoring Tool (Annex 5g/ 5h)

3. The investigation done by the relevant team should be done using the investigation form in Annex 5e.

4. All HCW confirmed to be **positive MERS-CoV** must be reported using 3 reporting systems:
    i. Communicable Diseases Notification using the Communicable Diseases Notification Form (Annex 5d)
    ii. Occupational Health Notification using WEHU L1/L2 (Refer Appendix 1 & 2) for all the cases of work-related MERS-CoV infections
    iii. Investigation Form Middle East Respiratory Syndrome Coronavirus (Annex 5e)

Any changes will be subjected to the current policy.

Appendix 1


NOTIFICATION OF OCCUPATIONAL LUNG DISEASE

* Softcopy is available online at: https://www.moh.gov.my/index.php/pages/view/994

Appendix 2

WEHU - L2

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

2 Type of occupational lung disease

- ☐ Occupational asthma
- ☐ Inhalation incident
- ☐ Hypersensitivity pneumonitis
- ☐ [illegible]
- ☐ [illegible]
- ☐ [illegible]
- ☐ [illegible]
- ☐ Lung cancer
- ☐ Mesothelioma
- ☐ Non - malignant pleural disease
- ☐ [illegible]
- ☐ [illegible]
- ☐ [illegible]
- ☐ Others: _____

[illegible] _____

4 [illegible]

- ☐ [illegible]
  [illegible]
- ☐ 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 [illegible]

- ☐ Still exposed to the agent at this workplace but using personal protective equipment .
- ☐ Still exposed to the agent at this workplace but not using personal protective equipment
- ☐ Same place of work but no longer exposed 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) : _____

* Softcopy is available online at: https://www.moh.gov.my/index.php/pages/view/994

NOTIFICATION FORM

"JADUAL
(Peraturan 2)
Borang
(Peraturan 2)
AKTA PENCEGAHAN DAN PENGAWALAN PENYAKIT BERJANGKIT 1988
PERATURAN-PERATURAN PENCEGAHAN DAN PENGAWALAN PENYAKIT BERJANGKIT (BORANG NOTIS PENYAKIT) 2018

Borang Notis Rev/2020
No. Siri: .....

NOTIFIKASI PENYAKIT BERJANGKIT YANG PERLU DILAPORKAN

(Seksyen 10, Akta Pencegahan Dan Pengawalan Penyakit Berjangkit 1988)

A. MAKLUMAT PESAKIT

1. Nama Penuh (HURUF BESAR):

Nama Penjaga (Ibu/Bapa/Penjaga):
(Jika belum mempunyai Kad Pengenalan diri)

2. No. Kad Pengenalan Diri / Dokumen Perjalanan ☐ Sendiri ☐ Penjaga
(Untuk Bukan Warganegara)

No. Daftar Hospital / Klinik: Nama Wad: Tarikh Masuk Wad: / /

3. Kewarganegaraan:
Warganegara:
☐ Ya Keturunan:
Sukukaturunan:
(Bagi Orang Asli, Pribumi Sabah/Sarawak)
☐ Tidak Negara Asal:
Status Kedatangan: ☐ Lain ☐ Tanpa Izin ☐ Penduduk Tetap

4. Jantina: ☐ Lelaki ☐ Perempuan

5. Tarikh Lahir: / /

6. Umur: ☐ Tahun ☐ Bulan ☐ Hari

7. Pekerjaan:
(Jika tidak bekerja, nyatakan status diri)

8. No. Telefon: ☐ Rumah ☐ Tel. Bimbit ☐ Pejabat
(Untuk dihubungi)

9. Alamat Kediaman

10. Alamat Tempat Kerja / Belajar:

B. DIAGNOSIS PENYAKIT

☐ 1. Poliomyelitis	☐ 17. Human Immunodeficiency Virus Infection	☐ 33. Typhus - *Scrub*
☐ 2. Viral Hepatitis A	☐ 18. Leprosy *(Multibacillary)*	☐ 34. Tuberculosis - *PTB Smear Positive*
☐ 3. Viral Hepatitis B	☐ 19. Leprosy *(Paucibacillary)*	☐ 35. Tuberculosis - *PTB Smear Negative*
☐ 4. Viral Hepatitis C	☐ 20. Leptospirosis	☐ 36. Tuberculosis - *Extra Pulmonary*
☐ 5. Viral Hepatitis *(Others)*	☐ 21. Malaria - *Vivax*	☐ 37. Typhoid - *Salmonella typhi*
☐ 6. AIDS	☐ 22. Malaria - *Falciparum*	☐ 38. Typhoid - *Paratyphoid*
☐ 7. Chancroid	☐ 23. Malaria - *Malariae*	☐ 39. Viral Encephalitic - *Japanese*
☐ 8. Cholera	☐ 24. Malaria - *Others*	☐ 40. Viral Encephalitis - *Akpah*
☐ 9. Dengue Fever	☐ 25. Measles	☐ 41. Viral Encephalitis - *(Others)*
☐ 10. Dengue Haemorrhagic Fever	☐ 26. Plague	☐ 42. Whooping Cough / Pertusis
☐ 11. Diphtheria	☐ 27. Rabies	☐ 43. Yellow Fever
☐ 12. Dysentery	☐ 28. Relapsing Fever	☐ 44. Avian Influenza
☐ 13. Ebola	☐ 29. Syphilis - *Congenital*	☐ 45. MERS-CoV
☐ 14. Food Poisoning	☐ 30. Syphilis - *Acquired*	☐ 46. Zika Virus Infection
☐ 15. Gonorrhoea	☐ 31. Tetanus Neonatorum	☐ 47. Others: *(please specify)* _____
☐ 16. Hand, Foot and Mouth Disease	☐ 32. Tetanus *(Others)*	

Selain dari notifikasi bertulis, penyakit berikut perlu dinotifikasi melalui telefon dalam tempoh 24 jam iaitu:- Avian Influenza, Demam Denggi, Demam Kuning, Diphtheria, Ebola, Keracunan Makanan, Kolera, Measles, MERS-CoV, Plague, Poliomyelitis Akut, Rabies dan Zika Virus Infection.

11. Cara Pengesanan Kes:
☐ Kes ☐ Kontak ☐ ICM/EMA *
☐ Lain Sumber: _____

12. Status Pesakit:
☐ Hidup
☐ Mati / /

13. Tarikh Onset: / /

14. Ujian Makmal:
Nama Ujian: (1) _____
(2) _____ (3) _____
Tarikh Spesimen Diambil: / /

15. Keputusan Ujian Makmal:
☐ Positif (_____)
☐ Negatif
☐ Belum Siap

16. Status Diagnosis:
☐ Sementara *(Provisional/Suspected)*
☐ Disahkan *(Confirmed)*
Tarikh Diagnosis: / /

17. Maklumat Klinikal Yang Relevan:

18. Komen:

C. MAKLUMAT PEMBERITAHU

19. Nama Pengamal Perubatan:

20. Nama Hospital / Klinik dan Alamat:

21. Tarikh Pemberitahuan: / /

Tandatangan
Pengamal Perubatan

BORANG SIASATAN
MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS (MERS-CoV)

Panduan Untuk Pengguna Borang:
Borang ini digunakan bagi mengumpulkan maklumat berkaitan potensi pendedahan (*potential exposures*) kes *probable* dan kes yang disahkan dijangkiti oleh MERS-CoV dengan mengambil kira tempoh **14 hari sebelum** bermulanya onset gejala yang dialami. Sekiranya individu tidak dapat menjawab soalan yang terkandung dalam borang siasatan ini (sama ada telah meninggal dunia, tidak sedarkan diri atau terlalu lemah untuk bercakap), saudara rapat atau kawan kepada individu boleh menjawab bagi pihaknya.

1.0	**Maklumat Kes MERS**		
1.1	Nama Penuh		
1.2	No.Kad Pengenalan		
1.3	Alamat Kediaman		
1.4	Koordinat GPS *(sekiranya ada)*	Lat:	Long:
1.5	Jenis Kediaman *(tandakan √ ruangan yang disediakan*)	○ Rumah persendirian ○ Rumah teres ○ Apartment ○ Lain-lain, nyatakan: …….. ○ Asrama institusi pendidikan ○ Pusat jagaan ○ Penjara / PUSPEN ○ Lain-lain, nyatakan: ……..	
1.6	Isi rumah	Jumlah keseluruhan isi rumah : ..... orang *(**Nota:** Sila dapatkan 'linelisting' mengikut format di item **6**)*	
1.7	Individu ini adalah *(tandakan √ ruangan yang disediakan*)	○ Kes berkemungkinan *(probable case)*	○ Kes disahkan *(confirmed case*
1.8	Jantina	○ Lelaki	○ Perempuan
1.9	Umur *(bagi kes yang berumur < 1 tahun nyatakan bulan)*	……. tahun …….. bulan	
1.10	Pekerjaan		
1.11	Tempat Kerja		
1.11	Tarikh Onset Gejala	…../…../…..	

2.0	**STATUS SEMASA KES MERS**			
2.1	**Gejala Klinikal Yang Dialami**	**Ada**	**Tiada**	**Tarikh Onset**
2.1.1	Demam			
2.1.2	Batuk			
2.1.3	Sakit Tekak			
2.1.4	Sakit Sendi			
2.1.5	Cirit			
2.1.6	Muntah			
2.1.7	Sakit Perut			
2.1.8	Sesak Nafas			
2.1.9	Lain-lain, (nyatakan)			

2.2	**Jenis Ujian Makmal dan Pemeriksaan Radiologi Yang Dijalankan**			
2.2.1	**Ujian Makmal:** Senaraikan ujian pengesahan MERS yang dijalani			
	Jenis Ujian Makmal	Tarikh Spesimen Diambil	Keputusan	Tarikh Keputusan
2.2.2	**X-Ray Dada**:			
	Nyatakan tarikh x-ray dilakukan dan keputusannya:			

3.0	**SEJARAH PENDEDAHAN**			
3.1	**Sejarah Kontak Dengan Kes Disahkan MERS**			
3.1.1	Sejarah kontak dengan kes yang telah disahkan MERS sepanjang tempoh 14 hari sebelum bermulanya onset gejala yang dialami?	○ Ya	○ Tidak	○ Tidak tahu
3.1.2	Sekiranya **Ya**, nyatakan nama dan no. telefon kes MERS tersebut	Nama:……... No. telefon:……..		
3.1.3	Hubungan dengan kes yang telah disahkan MERS tersebut	○ Suami / Isteri ○ Anak ○ Pengamal Perubatan (doktor/ jururawat dan sebagainya) ○ Majikan ○ Rakan Sekerja ○ Lain-lain, nyatakan: ……		
3.1.4	Tarikh Akhir Pendedahan Kepada Kes	…../…../…..		

3.2	**Sejarah Lawatan / Rawatan Di Fasiliti Kesihatan**			
3.2.1	Melawat / dirawat di mana-mana fasiliti kesihatan yang mana kes / wabak MERS dilaporkan sepanjang tempoh 14 hari sebelum bermulanya onset gejala yang dialami?	○ Ya	○ Tidak	○ Tidak tahu
3.2.2	Sekiranya **Ya**, nyatakan nama dan tarikh lawatan / dirawat di fasiliti kesihatan tersebut	Nama fasiliti kesihatan	Tarikh masuk	Tarikh keluar
			…../…../…..	…../…../…..
			…../…../…..	…../…../…..
			…../…../…..	…../…../…..
			…../…../…..	…../…../…..
3.3	**Sejarah Perjalanan / Pengembaraan Terkini**			
3.3.1	Pernah berada di negara Timur Tengah atau negara yang melaporkan penularan aktif jangkitan MERS dalam tempoh 14 hari sebelum bermulanya onset gejala dialami?	○ Ya	○ Tidak	○ Tidak tahu
3.3.2	Sekiranya **Ya**, dapatkan butiran penginapan semasa berada di negara tersebut:	Nama penginapan	Tarikh *check-in*	Tarikh *check-out*
			…../…../…..	…../…../…..
			…../…../…..	…../…../…..
			…../…../…..	…../…../…..
			…../…../…..	…../…../…..
3.3.3	Sekiranya **Ya** (bagi soalan **3.3.1**), pernahkah melawat / dirawat di mana-mana fasiliti kesihatan semasa berada di negara tersebut?	○ Ya	○ Tidak	○ Tidak tahu
3.3.4	Sekiranya **Ya,** sila senaraikan fasiliti kesihatan tersebut di **3.2.2**			
3.3.5	Sekiranya **Ya** (bagi soalan **3.3.1**), pernahkah terlibat dengan aktiviti perkumpulan besar?	○ Ya	○ Tidak	○ Tidak tahu
3.3.6	Nyatakan aktiviti perkumpulan besar tersebut	○ Haji ○ Umrah ○ Acara sukan ○ Persidangan ○ Lain-lain, nyatakan: ……		
3.4	**Sejarah Pendedahan Kepada Unta Baka Arab (Unta Dengan 1 Bonggol)**			
3.4.1	Melawat pasar / perlumbaan / ladang unta dalam tempoh 14 hari sebelum bermulanya onset gejala yang dialami?	○ Ya	○ Tidak	○ Tidak tahu
3.4.2	Menyentuh unta dalam tempoh 14 hari sebelum bermulanya onset gejala yang dialami?	○ Ya	○ Tidak	○ Tidak tahu
3.4.3	Kontak kepada darah, air kencing atau produk mentah seperti daging, susu unta dalam tempoh 14 hari sebelum bermulanya onset gejala yang dialami?	○ Ya	○ Tidak	○ Tidak tahu
3.4.4	Ahli keluarga melawat pasar / perlumbaan / ladang unta dalam tempoh 14 hari sebelum bermulanya onset gejala yang dialami?	○ Ya	○ Tidak	○ Tidak tahu

3.4.5	Ahli keluarga menyentuh unta dalam tempoh 14 hari sebelum bermulanya onset gejala yang dialami?	○ Ya	○ Tidak	○ Tidak tahu
3.5	**Sejarah Pendedahan Kepada Haiwan Lain**			
3.5.1	Menyentuh haiwan selain unta dalam tempoh 14 hari sebelum bermulanya onset gejala yang dialami?	○ Ya	○ Tidak	○ Tidak tahu
3.5.2	Sekiranya **Ya**, nyatakan / senaraikan haiwan tersebut			

4.0	**SEJARAH PENYAKIT KRONIK YANG DIHIDAPI KES MERS**			
4.1	**Bagi wanita:** Adakah sedang hamil pada ketika ini? Jika **Ya**, dapatkan butiran mengenai kehamilan (cth. Berapa minggu hamil?)	○ Ya	○ Tidak	○ Tidak tahu
4.2	Mengidap mana-mana penyakit berikut?			
	4.2.1 Penyakit buah pinggang kronik	○ Ya	○ Tidak	○ Tidak tahu
	4.2.2 Sistem immuniti yang lemah *(cth. kanser, HIV, dll)*	○ Ya	○ Tidak	○ Tidak tahu
	4.2.3 Penyakit kencing manis (*diabetes*)	○ Ya	○ Tidak	○ Tidak tahu
	4.2.4 Lelah (*asthma*)	○ Ya	○ Tidak	○ Tidak tahu
	4.2.5 Penyakit jantung	○ Ya	○ Tidak	○ Tidak tahu
	4.2.6 Penyakit hati (*liver disease*)	○ Ya	○ Tidak	○ Tidak tahu
	4.2.7 Lain-lain penyakit, (nyatakan): ……..	○ Ya	○ Tidak	○ Tidak tahu

5.0 MAKLUMAT BERKAITAN AKTIVITI SEHARIAN KES MERS			
Hari Sebelum / Selepas Onset	**Tarikh**	**Perincian Aktiviti Harian**	**Kontak (nama & no. telefon)**
14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4			
3			
2			
1			
Hari Onset			
1			
2			
3			
4			
5			

6.0 SENARAI KONTAK RAPAT KEPADA KES MERS					
Nama	**Umur**	**Jantina**	**Hubungan**	**Tarikh Kontak Terakhir**	**No. Telefon**

Maklumat Pemberi Maklumat (Jika menjawab soalan bagi pihak kes MERS)	
Nama	
Hubungan Dengan Kes	
No. Telefon	
Maklumat Pegawai Penyiasat	
Nama	
Jawatan & Tempat Bertugas	
Tarikh & Masa Siasatan	
Tandatangan	

NAMA KES *PROBABLE / CONFIRMED* MERS-CoV: ……

SENARAI KONTAK RAPAT KEPADA KES *PROBABLE / CONFIRMED* MERS

Bil.	Nama	* Kategori Kontak	Tarikh Pendedahan	No. Kad Pengenalan	Jantina (L/P)	Umur	Alamat	No. Telefon	#Status Pemantauan Kontak Rapat (*NOTA: Bilangan lajur untuk disediakan hendaklah mengikut bilangan hari pemantauan bagi KESEMUA kontak)*														Ujian Pengesahan MERS				Catatan
									Tarikh (Hari 1)	Tarikh (Hari 2)	Tarikh (Hari 3)	Tarikh (Hari 4)	Tarikh (Hari 5)	Tarikh (Hari 6)	Tarikh (Hari 7)	Tarikh (Hari 8)	Tarikh (Hari 9)	Tarikh (Hari 10)	Tarikh (Hari 11)	Tarikh (Hari 12)	Tarikh (Hari 13)	Tarikh (Hari 14)	Jenis Sampel	Tarikh Diambil	Tarikh Keputusan	Keputusan	

PETUNJUK:

S	Kontak berada dalam keadaan sihat.
R	Kontak mempunyai gejala TETAPI tidak perlu dimasukkan ke hospital.
H	Kontak mempunyai gejala DAN dimasukkan ke hospital bagi menerima rawatan lanjut.
T	Tempoh pemantauan kontak telah tamat.

* Kategori kontak boleh dinyatakan sebagai ahli keluarga serumah, rakan kumpulan/ pakej umrah / pelancongan yang sama, saudara mara, sahabat handai, anggota kesihatan yang mempunyai kontak dengan kes MERS-CoV tanpa memakai PPE seperti diarahkan : meliputi anggota kesihatan di wad di mana dia dirawat, anggota kerja di makmal yang mengendalikan spesimennya, juru x-ray yang mengendalikan ujian baginya, anggota sokongan terlibat seperti pemandu ambulans dan sebagainya.

TATACARA PENILAIAN DAN PEMANTAUAN KESIHATAN KENDIRI

A. TATACARA PENILAIAN KESIHATAN KENDIRI

Amalkan langkah-langkah mudah berikut apabila anda jatuh sakit:

- Bagi yang bekerja / bersekolah, gunakan cuti sakit yang diberikan oleh doktor untuk berehat di rumah;
- Hadkan pergaulan dengan orang sekeliling;
- Tutup mulut dan hidung menggunakan tisu apabila batuk dan bersin. Sejurus selepas itu, buang tisu yang telah digunakan ke dalam tong sampah;
- Amalkan etika batuk yang betul;
- Sentiasa mengamalkan tahap kebersihan diri yang tinggi seperti kerap mencuci tangan dengan menggunakan air dan sabun atau bahan pencuci tangan (*hand sanitizer*), terutamanya selepas batuk atau bersin; dan
- Pakai pelitup muka (*mask*) apabila berurusan dengan orang lain.

Individu dengan gejala demam dan batuk dan / atau sakit tekak adalah dinasihatkan untuk mendapatkan rawatan perubatan sekiranya mengalami mana-mana gejala pada bila-bila masa seperti berikut:

- Kesukaran bernafas: tercungap - cungap, pernafasan menjadi laju atau warna bibir bertukar menjadi ke biruan;
- Sakit dada yang berterusan;
- Cirit – birit dan / atau muntah yang berterusan;
- Demam yang berpanjangan sehingga melebihi 3 hari atau demam yang berulang semula selepas 3 hari;
- Perubahan tingkah laku, kurang responsif, keliruan / atau sawan;
- Mudah merasa pening / pusing apabila berdiri; atau
- Kurang buang air kecil (daripada kebiasaannya).

Jika anda mempunyai mana-mana gejala di atas, segera dapatkan rawatan dari fasiliti kesihatan terdekat:

- Pergi dapatkan rawatan dengan menggunakan kenderaan persendirian; atau
- Jika perkhidmatan ambulan diperlukan, sila dail 999 untuk bantuan.

***Perhatian:** Sila simpan kad ini bersama anda dan serahkan kepada mana-mana fasiliti kesihatan yang anda kunjungi. Kad ini perlu disimpan selama 14 hari dari tarikh ia diberikan kepada anda.*

Tandatangan		Diedarkan Oleh Petugas PKD ……..... Sebarang pertanyaan, sila hubungi:
Nama petugas		
Jawatan		
Tarikh Pemberian Kepada Kontak:		

B. PEMANTAUAN KESIHATAN KENDIRI BAGI INDIVIDU YANG DISYAKI MEMPUNYAI GEJALA MERS

Nama	:	
No. Kad Pengenalan	:	
No. Telefon	:	Bimbit: ……..…… Rumah: ……...……
Alamat Rumah	:	
Faktor Risiko *[tandakan (√) di kotak berkenaan]*	:	☐ Sejarah bermastautin / perjalanan ke negara Timur Tengah atau negara yang baru melaporkan kes MERS ☐ Kontak rapat kepada kes positif MERS ☐ Bekerja / melawat / mendapatkan rawatan di fasiliti kesihatan di mana kes / wabak MERS dilaporkan
Tarikh Akhir Pendedahan	: …/.../...	Tarikh Pemantauan 14 Hari Berakhir : …/.../...

JADUAL PEMANTAUAN HARIAN

ARAHAN: Sila tandakan (√) pada ruangan yang berkenaan, sekiranya anda mengalami sebarang gejala seperti dalam senarai di bawah

Hari	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Tarikh	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...
Gejala														
Demam														
Batuk														
Sakit tekak														
Sakit sendi														
Cirit														
Muntah														
Sakit perut														

Annex 5h

HOME ASSESSMENT & MONITORING TOOL

A. HOME ASSESSMENT TOOL

Practice these simple steps if you are at home:

- Use the medical leave provided by your doctor wisely by staying at home and rest;
- While sick, limit contact with others as much as possible to keep from infecting them;
- Cover your mouth and nose using tissue whenever you cough or sneeze. Throw the tissue in the thrash after you use it;
- Always follow cough etiquette;
- Always maintain good personal hygiene and cleanliness. Wash your hands often with soap and water or hand sanitizer, especially after coughing or sneezing; and
- Use face mask whenever being in public or close contact with people.

Individual with fever and cough and/or sore throat are advised to **IMMEDIATELY** seek medical care should they develop any of the symptoms and signs listed below:

- Breathing difficulties: shortness of breath, rapid breathing or purple/blue discoloration of the lips;
- Persistent chest pains;
- Persistent diarrhea and/or vomiting;
- Fever persisting beyond 3 days or recurring after 3 days;
- Abnormal behavior, confusion, less responsive and / or convulsion;
- Dizziness; or
- Reduced urine production.

If you have any of the above signs, go to the nearest healthcare facility:

- Using own transport; or
- Call 999 for assistance, if ambulance service is needed.

Important: Please keep this with you and present it to any facility should you return. Keep it for 14 days from the day it was issued.

Signature:		Distributed by the District Health Office (PKD) of ……....
Name of MOH Personnel :		
Designation ÷		Any questions? Kindly contact:
Date of Issuance ÷		

B. HOME MONITORING TOOL FOR PERSON SUSPECTED WITH MIDDLE EAST RESPIRATORY SYNDROME (MERS)

Name	:		
Identity Card Number	:		
Telephone Number	:	Handphone: …….…….. Home: ……..…..……	
Home Address	:		
Risk Factors *[please tick (√) the relevant box]*	:	☐ History of residing in / travel from the Middle East / other affected countries with active transmission of MERS ☐ Close physical contact with a confirmed of MERS infection ☐ Working / visiting / staying in a healthcare facility, where MERS-CoV outbreak have been reported	
Date of Exposure	:	…/.../...	Date When the 14-Days Monitoring Ended : …/.../...

DAILY MONITORING TABLE

INSTRUCTION: Please tick (√) at the relevant box, should you develop any of the symptoms listed as below

Day	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Date	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...	…/.../...
Symptom														
Fever														
Cough														
Sore Throat														
Joint pain														
Diarrhoea														
Vomitting														
Stomach ache														

KEMENTERIAN KESIHATAN MALAYSIA

Fail Rujukan:

Pejabat Kesihatan Daerah
…….
…….
…….
…….
No. Telefon: ……..

Kepada:

Nama: ……..
No. Kad Pengenalan: ……..
Alamat: ……
……..
……..

Perintah Pengawasan Dan Pemerhatian Di Rumah Kediaman Bagi Kontak Jangkitan *Middle East Respiratory Syndrome* (MERS-CoV) Di Bawah Seksyen 15(1) Akta Pencegahan Dan Pengawalan Penyakit Berjangkit 1988 (Akta 342)

Tuan/Puan telah dikenalpasti sebagai kontak terdekat kepada seorang yang telah disahkan menghidapi jangkitan MERS-CoV dan berkemungkinan Tuan/Puan telah terdedah kepada jangkitan itu. Seksyen 15(1) Akta Pencegahan dan Pengawalan Penyakit Berjangkit 1988, memperuntukkan kuasa kepada mana-mana pegawai yang diberikuasa untuk memerintahkan Tuan/Puan diasingkan di rumah bergantung kepada keperluan epidemiologi penyakit tersebut.

2. Bagi menjalankan kuasa di bawah Seksyen 15(1) Akta 342, saya ……., pegawai diberikuasa untuk meletakkan Tuan/Puan di bawah pengawasan dan pemerhatian di rumah seperti alamat di atas dengan syarat-syarat seperti dinyatakan di '**Lampiran A**'.

3. Sepanjang tempoh Tuan/Puan diletakkan di bawah pengawasan dan pemerhatian, Tuan/Puan adalah dikehendaki mematuhi segala perintah yang ditetapkan. Di bawah Seksyen 24 Akta yang sama, kegagalan mematuhi perintah ini, jika disabitkan kesalahan boleh dihukum bagi kesalahan pertama, dipenjara selama tempoh tidak melebihi 2 tahun atau didenda atau kedua-dua sekali, berkenaan dengan kesalahan kedua atau kesalahan berikutnya boleh dipenjara tidak melebihi 5 tahun atau denda atau kedua-duanya; berkenaan dengan kesalahan berterusan, didenda selanjutnya tidak melebihi dua ratus bagi tiap-tiap hari kesalahan ini berterusan.

Pegawai Yang Diberi kuasa	
Nama :	
Jawatan :	
Tarikh & Masa :	
Pengesahan Menerima Sesalinan Perintah Oleh Kontak Yang Diletakkan Di Bawah Pengawasan	
Nama :	
No. Kad Pengenala :	
Tarikh & Masa :	
Tandatangan :	

Lampiran A

Perintah Pengawasan Dan Pemerhatian Di Rumah Kediaman Bagi Kontak Jangkitan *Middle East Respiratory Syndrome Coronavirus* (MERS-CoV) Di Bawah Seksyen 15(1) Akta Pencegahan Dan Pengawalan Penyakit Berjangkit 1988 (Akta 342)

Tindakan Yang Perlu Dilakukan Semasa Dalam Tempoh Pemerhatian Dan Pengawasan

A. Tinggal Di Rumah Kediaman Beralamat Di Atas

i. Hendaklah tinggal di rumah kediaman seperti di alamat yang dinyatakan sepanjang masa bermula dari ……. hingga ……..

ii. Anda dikehendaki mengasingkan diri daripada ahli keluarga yang lain, umpamanya berada di bilik yang berasingan. Sekiranya perlu berinteraksi dengan ahli keluarga, anda dikehendaki untuk memakai penutup mulut dan hidung (*mask*).

iii. Aturkan dengan waris / saudara mara / rakan untuk membeli keperluan harian.

iv. Jika anda terpaksa pergi ke suatu tempat kerana tidak dapat ditangguhkan, sila hubungi dan dapatkan nasihat daripada Pegawai Kesihatan Daerah di nombor telefon: ……

v. Jika anda memerlukan bantuan mengenai keperluan harian, sila hubungi nombor telefon: ……..

vi. Elakkan daripada berhubung secara dekat dengan ahli-ahli keluarga / rakan-rakan. Sekiranya saudara mara, shabat handai menziarahi anda – adalah menjadi tanggungjawab anda untuk mencatatkan nama, nombor telefon dan tarikh kunjungan mereka.

vii. Pasangan, anak-anak, adik beradik atau mana-mana individu lain yang tinggal serumah tetapi TIDAK dikenakan perintah pengawasan dan pemerhatian di rumah adalah BEBAS untuk melakukan aktiviti seharian mereka.

B. Pemeriksaan Saringan

i. Anda dikehendaki untuk menjalani dua (2) ujian saringan semasa menjalani perintah pengawasan dan pemerhatian di rumah kediaman:
   - Ujian saringan pertama akan dilaksanakan pada hari pertama anda mula menjalani perintah terbabit;
   - Ujian saringan kedua akan dilaksanakan pada hari keempat belas (14) selepas ujian saringan pertama dijalankan.

ii. Jenis ujian yang akan dilaksanakan adalah melibatkan pengambilan sampel palitan *nasopharyngeal* (NP) dan *oropharyngeal* (OP) oleh anggota kesihatan / perubatan yang dikenalpasti.

iii. Anda hanya akan diberi pelepasan daripada menjalani perintah pengawasan dan pemerhatian dirumah apabila ujian saringan kedua adalah disahkan negatif.

C. Periksa Gejala Jangkitan

i. Periksa suhu badan setiap hari dan keadaan ini perlu dipantau selama EMPAT BELAS (14) hari bermula dari tarikh …….

ii. Penutup mulut dan hidung (*mask*) hendaklah dipakai sepanjang masa jika anda demam atau batuk sebelum bantuan perubatan tiba.

iii. Jika anda mengalami mana-mana gejala dan tanda seperti berikut, **SEGERA** hubungi Pegawai Kesihatan Daerah di nombor telefon: ……..…….…… untuk tindakan selanjutnya:

- Gejala demam dan batuk dan/atau sakit tekak
- Kesukaran bernafas – tercungap cungap, pernafasan menjadi laju atau warna bibir bertukar menjadi kebiruan;
- Batuk berdarah;
- Sakit dada yang berterusan;
- Cirit birit dan/atau muntah yang berterusan;
- Demam yang berpanjangan sehingga melebihi 3 hari atau demam yang berulang semula selepas 3 hari;
- Perubahan tingkah laku, kurang responsif, keliru dan/atau sawan;
- Mudah merasa pening/pusing apabila berdiri;
- Kurang buang air kecil (daripada kebiasaannya).

D. Amalkan Kebersihan Diri

i. Sentiasa amalkan tahap kebersihan diri yang tinggi seperti kerap mencuci tangan dengan menggunakan air dan sabun atau bahan pencuci tangan (*hand sanitizer*), terutamanya selepas batuk atau bersin.

ii. Amalkan adab batuk yang baik. Tutup mulut dan hidung anda menggunakan tisu apabila anda batuk dan bersin. Sejurus selepas itu, buang tisu yang telah digunakan ke dalam tong sampah bertutup.

iii. Dapatkan pengudaraan yang baik di dalam rumah.

iv. Bersihkan permukaan dan objek yang mungkin dicemari dengan kahak, cecair batuk/bersin atau bendalir serupa yang keluar dari hidung atau mulut dengan menggunakan bahan cucian seperti c*hlorox.* Bancuhan yang disyorkan ialah 1 bahagian *chlorox* kepada 50 bahagian air.

E. Perkara-Perkara Yang Dilarang

i. Menanggalkan penutup mulut dan hidung (*mask*) apabila dikunjungi oleh waris atau tetamu.

ii. Meninggalkan rumah kediaman beralamat di atas bagi tujuan membeli belah, bersiar-siar ke padang permainan atau ke tempat awam.

PERINGATAN

Pemeriksaan mengejut akan dilakukan bagi memastikan perintah-perintah di atas dipatuhi dan kegagalan mematuhi perintah-perintah di atas boleh menyebabkan tindakan mahkamah dikenakan ke atas Tuan/Puan.

MINISTRY OF HEALTH MALAYSIA

Our Ref.:

District Health Office
…….
…….
…….
…….
Telephone No: ……..

To:

Name: ……..
Identification Card / Passport No: ……..……...
Address: ……
……
……...

Order For Supervision And Observation At Home For Contact Of Middle East Respiratory Syndrome Coronavirus (MERS-CoV) Infection Under Section 15(1) Prevention And Control Of Infectious Disease Act 1988 (Act 342)

You had been identified as contact to a confirmed case of MERS-CoV infection and there's possibility that you may have been exposed MERS-CoV infection. Under Section 15(1) Prevention and Control of Infectious Diseases Act 1988 (Act 342), an authorized officer may order you to be isolated at home based on epidemiological needs of the said infection.

2. To carry out the order under section 15(1) Act 342, I ……..…….., the authorized officer hereby place you under the order for supervision and observation at home as per address above with conditions as set out in '**Appendix A**'.

3. During the specified duration that you're placed under supervision and observation, you are required to comply with the order prescribed. Under Section 24 of the same Act, failure to comply with this order, if convicted; in respect of a first offence, to imprisonment for a term not exceeding two years or to fine or both; in respect of a second or subsequent offence, to imprisonment not exceeding five years or to fine or both; in respect of a continuing offence, to a further fine not exceeding two hundred ringgit for every day during which such offence continues.

The Authorized Officer		
Name	**:**	
Designation	**:**	
Date & Time	**:**	
Confirmation On Receiving A Copy Of The Order By The Individual Placed Under Supervision		
Name	**:**	
IC / Passport No.	**:**	
Date & Time	**:**	
Signature	**:**	

Appendix A

Supervision And Observation Order At Home For Contact Of Middle East Respiratory Syndrome Coronavirus (MERS-CoV) Infection Under Section 15(1) Prevention And Control Of Infectious Disease Act 1988 (Act 342)

Actions To Be Adhered To During The Supervision And Observation Period

A. Stay In Home As Per Address Above

i. Mandatory to stay at the home as per address above starting from …… till …… at all time.
ii. At all time, maintain isolation from other family members, for example, living in a separate room. If need arise to interact with other family members, wear a mask.
iii. Make arrangements with family members / friends for procument of daily needs.
iv. If you have to leave the home for emergency reasons, kindly contact and seek advice from the District Health Officer concerned at this number: ……
v. If assistance required for procument of daily needs, please contact: ……
vi. As possible, avoid interactions with family members / friends. If family members / friends visited you, it is your responsibility to register their name, contact number and date of their visit.
vii. The spouse, children, siblings and any other dwellers in the same house who are NOT subjected under similar order are FREE to continue with their daily routine.

B. Screening Test

i. Screening test will be conducted twice (2) during you stay at home under the supervision and observation order:
    - First screening test will be conducted on day one of the issuance of the order;
    - Second screening test will be conducted 14 days later.
ii. Types of samples involved are nasopharyngeal (NP) and oropharyngeal (OP) swabs, which will be taken by the designated personnel.
iii. If your second screening test is negative, you will be released from undergoing the supervision and observation order.

C. Observation Of Infection Symptoms

i. Monitor body temperature daily for duration of FOURTEEN DAYS (14) beginning from this date: ……

ii. Face mask must be worn at all time if you have a fever or cough prior to arrival of medical assistance.

iii. If you are experiencing any of the following symptoms, **IMMEDIATELY** inform the District Health Officer concerned at this telephone number:……..……. for further management:

- Fever and cough and/or sore throat
- Difficulty in breathing – gasping for breath, fast breathing or lip colour turns bluish;
- Coughing out blood;
- Continuous chest pain;
- Prolong diarrhoea and / or vomiting;
- Continuous fever for more than 3 days or recurring fever after 3 days;
- Change in behavior, less responsive, confused and / or convulsions;
- Easily feels dizziness / dizziness when standing up
- Reduced urination (than usual).

D. Maintain Personal Hygiene

i. Maintain good personal hygiene such as frequent hand washing with soap and water or hand sanitizer, especially after coughing or sneezing.

ii. Practice good cough etiquette. Cover your mouth and nose with a tissue when coughing or sneezing. Immediately after that, dispose of the soil tissue into a close dustbin.

iii. Maintain good ventilation in the house.

iv. Clean surfaces and objects that may be contaminated with phlegm, cough / sneezing fluids or similar fluid from the nose or mouth using disinfectant solutions such as Clorox. The recommended mix is 1 part of clorox to 50 parts of water.

E. Prohibited Matters

i. Removal of face mask when visited by relatives or friends.

ii. Leaving the home as per address above for grocery shopping, strolling to the playground or visiting public places.

WARNING

Checks will be conducted from time to time to ensure that the above mentioned commands are complied with and failure to comply with these commands may subject you to be imposed with court action.

KEMENTERIAN KESIHATAN MALAYSIA

Fail Rujukan:

Kepada:

Nama: ……..
No. Kad Pengenalan: ……..
Alamat: ……
……..
……..

Pelepasan Dari Menjalani Perintah Pengawasan Dan Pemerhatian Di Rumah Kediaman Bagi Kontak Jangkitan *Middle East Respiratory Syndrome Coronavirus* (MERS-CoV) Di Bawah Seksyen 15(1) Akta Pencegahan Dan Pengawalan Penyakit Berjangkit 1988 (Akta 342)

Dengan segala hormatnya perkara di atas adalah dirujuk.

2. Terdahulu, Tuan/Puan telah dikenalpasti sebagai kontak terdekat kepada seorang yang telah disahkan menghidapi jangkitan MERS-CoV dan Tuan/Puan telah dikenakan Perintah Pengawasan Dan Pemerhatian di rumah kediaman sebagaimana yang tertakluk di bawahSeksyen 15(1) Akta Pencegahan dan Pengawalan Penyakit Berjangkit 1988 (Akta 342) bermula dari ……. hingga ……..

3. Hasil pemeriksaan yang dijalankan oleh pihak kami mendapati status kesihatan Tuan/Puan adalah memuaskan. Oleh itu, Tuan/Puan adalah diberikan pelepasan dari menjalani pemerhatian dan pengawasan di bawah Akta 342, bermula dari tarikh seperti tersebut di bawah. Perhatian dan kerjasama yang telah Tuan/Puan berikan berhubung perkara ini adalah amat dihargai.

Sekian, terima kasih.

Pegawai Yang Diberikuasa		
Nama	**:**	
Jawatan	**:**	
Tempat Bertugas & No. Telefon	**:**	
Tarikh & Masa	**:**	

MINISTRY OF HEALTH MALAYSIA

Our Ref.:

To:

Name: ……..
Identification Card / Passport No: ……..
Address: ……
……..
……..

Release From Undergoing Supervision And Observation Order At Home For Contact Of Middle East Respiratory Syndrome Coronavirus (MERS-CoV) Infection Under Section 15(1) Prevention And Control Of Infectious Disease Act 1988 (Act 342)

With regards to the above mentioned.

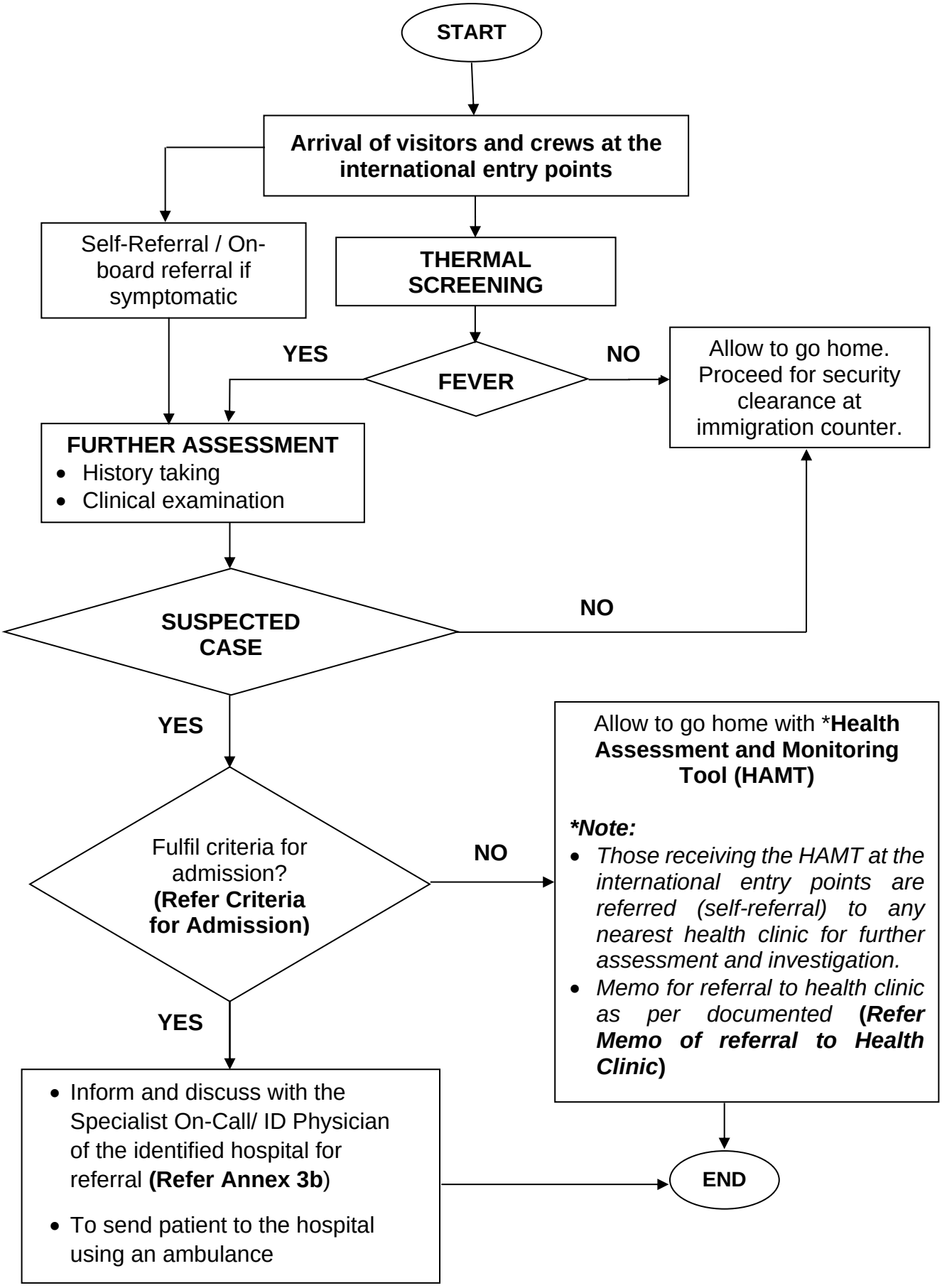
2. Earlier, you had been identified as one of the close contacts to a confirmed case of MERS-CoV infection and you had been ordered for Supervision and Observation at home under Section 15(1) Prevention And Control Of Infectious Disease Act 1988 (Act 342); starting from …….. till …….

3. Following the assessment carried out by our Ministry, your health status was found to be satisfactory. Therefore, you are given clearance from undergoing supervision and observation under Act 342, starting from the date mentioned below. The attention and cooperation given by you with regards to this matter is greatly appreciated and thanked.

Yours sincerely,

The Authorized Officer		
Name	**:**	
Designation	**:**	
Working address & Telephone No.	**:**	
Date & Time	**:**	

Flow Chart for Screening of Visitors and Crews Arriving from Middle Eastern Countries or Affected Countries with Active Transmission at the International Entry Points



Criteria for Admission

1. Not all suspects of MERS require admission.

2. Viral loads of confirmed MERS patients are at their highest (most infective) in those with severe illness, usually during the second week of the disease.

3. Decision for admission is based on the severity assessment of the patient by the primary care/ Family Medicine Specialist/ ID Physician.

4. Those who meet the case definition suspected of MERS with ANY signs of severe illness (but are not limited to) the following:
    i. Fever more than 2 days
    ii. SpO2 less than 95%
    iii. Respiratory rate >25/min
    iv. Angina chest pain
    v. Unable to tolerate orally
    vi. Unable to ambulate without assistance
    vii. Reduced level of consciousness

Memo of Referral to Health Clinic

From : Point of Entry (*PoE*)_____(*eg: Pejabat Kesihatan KLIA, PK KLIA*)
To : Respected Health Clinic

We are seeking your expert management with **further assessment** and **investigation** for the following name details as a 'suspected case of MERS-CoV'. Patient presented at Point of Entry (PoE) with the following symptoms, but NOT FULFILS criteria for admission.

Patient's details

Name :_____
IC No. :_____
Occupation :_____
Phone No. :_____
Home Address :_____
_____
_____

Travelling history

Destination :_____
Date departed from Malaysia :_____
Date return/arrived in Malaysia :_____

Medical History/ Clinical Details

Co-morbidity (*if any*):_____
List of current medication (*if any*):
1._____
2._____
3._____

Presented Signs and Symptoms :
1. _____
2. _____
3. _____
4. _____

Clinical examination upon presented at Point of Entry (PoE):
General condition :_____
Temperature :_____
Blood Pressure :_____
Pulse Rate :_____
Respiratory Rate :_____
Capillary Refill Time (CRT) :_____
SPO^2 :_____
Lungs :_____
Heart :_____

Sign and Chop (Medical Officer):
Date:

Management of Suspected MERS-CoV Related Events
At the international Point Entry Point (PoE)

1. Disembarkation of Travellers

a) Upon Arrival at Point of Entry (PoE)

- Visitors and crews arriving from the Middle Eastern Countries or Affected Countries with active transmissions are required to go through the thermal scanner at the PoE for temperature screening.
- Those with fever or found symptomatic will be referred for further examination and management. Symptomatic travellers may also proceed for a self-referral to the health screening counter/facility upon arrival.
- Asymptomatic travellers may proceed for the security clearance to the immigration counter.

b) Management of MERS- CoV Suspected Cases at Point of Entry (PoE)

- Symptomatic travellers (self-referral/ on-board referral/ thermal scanner screening) will proceed for a history taking and clinical examination.
- Upon history taking and clinical examination if any travellers fulfil the criteria for admission (***refer Annex 3a***) the team attending the traveller need to inform and discuss with the Specialist On-Call /ID Physician of the identified hospital for referral (***refer Annex 3b***) and the traveller will be sent to the hospital using an ambulance.
- Symptomatic travellers that do not fulfil the criteria for admission will be issued Home Assessment and Monitoring Tool (HAMT)[1] and allowed home. They are also to be referred (*self-referral*) to any nearest health clinic for further assessment and investigation.

2. Management of Airline Crew Members Following Completion of Flight

- Airline crew members may be exposed to the sick / deceased passenger. Therefore, they should follow the (same) practices and instructions described above.
- Routine infection prevention and control, such as hand hygiene and control of the source of infection through social distancing and cough etiquette (including wearing of masks by symptomatic individuals) are important control measures and should be followed by the crew if they are symptomatic.
- Crew members who may have been exposed to the sick / deceased passenger should monitor their health for 14 days following the exposure.
- They can continue to work as per their original schedule unless they become ill or develop symptoms.

1. *Those receiving the HAMT at the international entry points are to be referred (self-referral) to any nearest health clinic and be reminded to bring the HAMT and memo referral to health clinic along with them.*

- If they do developed symptoms including fever, cough, headache, body aches, sore throat, runny nose and sometimes include vomiting or diarrhoea, they should immediately take the following steps:
    - Stays at home except to seek medical care, do not report to work.
    - Notify their employer.
    - Contact their occupational health service or personal physician.
    - Inform the occupational health service, clinic or emergency room about the possible on-board exposure to the illness, following the event.
    - Limit contact with others as much as possible.
    - When not alone or in a public place, wear a mask.
    - Avoid taking public transport, if unavoidable hence used the least chance contact with public such as taxi or e-hailing transportation.

3. Cleaning & Disinfection of Aircraft

- Cleaning refers to the removal of visible dirt or particles, while disinfection refers to the measures taken to control, deactivate or kill infectious agents such as viruses and bacteria.
- Cleaning and disinfection on aircraft require special attention since it is necessary to use agents that are not corrosive or otherwise detrimental to aircraft components. It is therefore necessary to exercise caution in selecting suitable products and before applying them in the cabin. In addition, manufacturer's instructions must be followed carefully to protect the health of the cleaning personnel and to ensure effective action.
- Cleaning crews need to be adequately trained for routine cleaning and disinfection procedures and also for those to be implemented following a communicable disease event, since the requirements are likely to differ.
- Exposure to body fluids (such as respiratory secretions or blood), vomit or faeces may involve a risk of infection if not properly contained. Cleaning crews therefore need to follow the procedures that will ensure effective cleaning and disinfection and protect their health, using appropriate personal protective equipment. For more detailed technical guidance see the Guide to Hygiene and Sanitation in Aviation, which is available at: https://www.icao.int/safety/aviation-medicine/Suggested%20Literature/guide_hygiene_sanitation_aviation_3_edition.pdf

4. Health Advice at the Point of Entry (PoE) / In-flight Health Education

- In-flight announcement on safety measure and health precautions in the flights route to Middle Eastern Countries or Affected Countries with active transmissions of MERS-CoV.
- Digital health education and health precaution to prevent MERS-CoV infection/transmission at the terminal/ airport/ Point of Entry (PoE).
- Health teams at PoE to engage with airlines, PoE's management as well as travel agencies to advocate on health precaution to prevent MERS-CoV infection/transmission.

Public Health Passenger Locator Form: To protect your health, public health officers need you to complete this form whenever they suspect a communicable disease onboard a flight. Your information will help public health officers to contact you if you were exposed to a communicable disease. It is important to fill out this form completely and accurately. Your information is intended to be held in accordance with applicable laws and used only for public health purposes. ~***Thank you for helping us to protect your health.***

One form should be completed by an adult member of each family. Print in capital (UPPERCASE) letters. Leave blank boxes for spaces.

FLIGHT INFORMATION: **1. Airline name** | **2. Flight number** | **3. Seat number** | **4. Date of arrival (yyyy/mm/dd)** (2 0 ...)

PERSONAL INFORMATION: **5. Last (Family) Name** | **6. First (Given) Name** | **7. Middle Initial** | **8. Your sex** Male ☐ Female ☐

PHONE NUMBER(S) where you can be reached if needed. Include country code and city code.

9. Mobile | **10. Business**

11. Home | **12. Other**

13. Email address

PERMANENT ADDRESS: **14. Number and street** ***(Separate number and street with blank box)*** | **15. Apartment number**

16. City | **17. State/Province**

18. Country | **19. ZIP/Postal code**

TEMPORARY ADDRESS: If you are a visitor, write only the first place where you will be staying.

20. Hotel name (if any) | **21. Number and street** ***(Separate number and street with blank box)*** | **22. Apartment number**

23. City | **24. State/Province**

25. Country | **26. ZIP/Postal code**

EMERGENCY CONTACT INFORMATION of someone who can reach you during the next 30 days

27. Last (Family) Name | **28. First (Given) Name** | **29. City**

30. Country | **31. Email**

32. Mobile phone | **33. Other phone**

34. TRAVEL COMPANIONS – FAMILY: Only include age if younger than 18 years

	Last (Family) Name	First (Given) Name	Seat number	Age <18
(1)				
(2)				
(3)				
(4)				

35. TRAVEL COMPANIONS – NON-FAMILY: Also include name of group (if any)

	Last (Family) Name	First (Given) Name	Group *(tour, team, business, other)*
(1)			
(2)			

SOALAN LAZIM BERKENAAN *MIDDLE EAST RESPIRATORY SYNDROME* (MERS)

1. Apa itu *Middle East Respiratory Syndrome* (MERS)?

- Penyakit saluran pernafasan yang disebabkan oleh virus korona yang dikenali sebagai "*Middle East Respiratory Syndrome Coronavirus*" (MERS-CoV).
- Famili virus korona boleh menyebabkan penyakit pada manusia seperti selesema biasa sehingga Sindrom Pernafasan Akut Teruk (*Severe Acute Respiratory Syndrome* - SARS).

2. Di manakah kes MERS dikenal pasti?

- MERS telah dilaporkan di 27 buah negara sejak tahun 2012.
- 80% kes dilaporkan oleh negara Arab Saudi.
- Kes yang dikenal pasti di luar Timur Tengah adalah mereka yang asalnya mendapat jangkitan di Timur Tengah dan kemudian mengembara keluar atau pulang ke kawasan lain.

3. Apakah gejala MERS?

- Demam
- Batuk
- Kesukaran bernafas
- Cirit-birit akibat radang saluran pencernaan (*gastroenteritis*) kadangkala berlaku

Kebanyakan kes MERS mengalami radang paru-paru (*pneumonia*). Namun, terdapat juga kes yang tidak menunjukkan sebarang gejala.

4. Tahap keterukan MERS

MERS-CoV boleh menyebabkan gejala yang serius terutamanya bagi golongan berisiko tinggi seperti:

- Individu dengan kurang daya tahan;
- Warga emas;
- Individu yang mempunyai penyakit kronik seperti diabetes, kanser, dan penyakit paru-paru kronik.

5. Tahap keterukan MERS

Kes MERS yang serius boleh menyebabkan:

- Kegagalan pernafasan;
- Kegagalan organ, terutamanya buah pinggang;
- *Septic shock;*
- Perlu dirawat di unit rawatan rapi (ICU);
- Perlu alat bantuan pernafasan.

6. Tahap keterukan MERS

- Kadar kematian 35%.
- Belum ada vaksin buat masa ini.
- Tiada rawatan khusus. Rawatan bersifat simptomatik dan sokongan berdasarkan keadaan klinikal pesakit.

7. Bagaimanakah seseorang boleh dijangkiti virus MERS?

a) Dari haiwan kepada manusia
Dari unta baka Arab yang dijangkiti virus MERS-CoV kepada manusia melalui:
- kontak langsung (tanpa sebarang perlindungan diri); atau
- tidak langsung seperti pengambilan produk unta seperti daging dan susu mentah.

b) Dari manusia kepada manusia
- tidak mudah merebak dari manusia kepada manusia, melainkan melalui kontak rapat tanpa perlindungan;
- boleh berlaku ketika menjaga pesakit MERS tanpa perlindungan.

8. Langkah pencegahan MERS

Nasihat kepada individu ketika berada di Timur Tengah, terutamanya kepada golongan berisiko tinggi:

ELAKKAN:
- bersentuhan dengan unta baka Arab;
- mengambil susu unta mentah;
- mengambil air kencing unta; atau
- memakan daging unta yang tidak dimasak dengan betul.

9. Langkah pencegahan MERS

Hubungi petugas kesihatan untuk penilaian kesihatan jika mempunyai kontak rapat dengan individu yang dijangkiti MERS-CoV dalam tempoh 14 hari.

10. Langkah pencegahan MERS

Jika melawat ladang, pasar atau pameran unta:
- Kerap mencuci tangan sebelum dan selepas menyentuh unta dan haiwan lain;
- Elakkan menyentuh unta atau haiwan yang sakit;
- Jangan mengambil susu unta mentah, air kencing unta dan daging unta yang tidak dimasak dengan sempurna.

FREQUENTLY ASK QUESTIONS ON MIDDLE EAST RESPIRATORY SYNDROME (MERS)

1. What is Middle East respiratory syndrome (MERS)?

- Middle East respiratory syndrome (MERS) is a viral respiratory illness caused by a coronavirus (Middle East respiratory syndrome coronavirus, or MERS-CoV) that was first identified in Saudi Arabia in 2012.
- Coronaviruses are a large family of viruses that can cause diseases in humans, ranging from the common cold to Severe Acute Respiratory Syndrome (SARS).

2. What are the symptoms of MERS? How severe is it?

- A typical case of MERS includes fever, cough, and/or shortness of breath. Pneumonia is common, however some people infected with the MERS virus have been reported to be asymptomatic. Gastrointestinal symptoms, including diarrhoea, have also been reported.
- Severe cases of MERS can include respiratory failure that requires mechanical ventilation and support in an intensive-care unit.
- Some patients have had organ failure, especially of the kidneys, or septic shock. The virus appears to cause more severe disease in people with weakened immune systems, older people, and people with chronic diseases as diabetes, cancer, and chronic lung disease.
- The mortality rate for people with the MERS virus is approximately 35% – this may be an overestimate however, as mild cases may be missed by existing surveillance systems.

3. Is there a vaccine for MERS-CoV? What is the treatment?

No vaccine or specific treatment for MERS is currently available, however there are several vaccines for MERS in development. Treatment is supportive and based on a person's clinical condition.

4. Where have cases of MERS been identified?

- MERS has been reported in 27 countries since 2012, with approximately 80% of human cases reported by the Kingdom of Saudi Arabia.
- Cases identified outside the Middle East are people who were infected in the Middle East and travelled to areas outside the Middle East. On rare occasions, small outbreaks have occurred in areas outside the Middle East.

5. How do people get infected with the MERS virus?

The MERS virus is transmitted primarily from infected dromedary camels to people, but transmission from people to people is also possible.

a) From animals to people

- MERS-CoV is a zoonotic virus, meaning it is transmitted between animals and people. Scientific evidence suggests that people are infected through unprotected direct or indirect contact with infected dromedary camels.
- The MERS virus has been identified in dromedary camels in several countries, including Burkina Faso, Egypt, Ethiopia, Iran, Jordan, Kenya, Kingdom of Saudi Arabia, Kuwait, Mali, Morocco, Netherlands, Nigeria, Oman, Pakistan, Qatar, Spain (Canary Islands), Somalia, Sudan, Tunisia, and the United Arab Emirates.. There is further evidence suggesting the MERS-CoV is widespread in dromedary camels in the Middle East, Africa and South Asia.
- It is possible that other animal reservoirs exist, however animals including goats, cows, sheep, water buffalo, swine, and wild birds have been tested for MERS-CoV and the virus has not been found.

b) Between people

- The MERS virus does not pass easily between people unless there is close unprotected contact, such as the provision of clinical care to an infected patient without strict hygiene measures.
- Transmission between people has been limited to-date, and has been identified among family members, patients, and health care workers. The majority of reported MERS cases to date have occurred in health care settings.

6. Can someone be infected with MERS-CoV and not be ill?

- Yes, infection with MERS-CoV can be asymptomatic.
- Infected people with no symptoms have been identified because they were tested for MERS-CoV during investigations among contacts of people known to be infected with MERS-CoV. The role of asymptomatic infected individuals in transmission is currently unknown and under investigation.

7. What should a person do if she/he has contact with a person who has MERS?

If you have had close contact with someone infected with MERS-CoV within the last 14 days without using the recommended infection control precautions, you should contact a healthcare provider for an evaluation.

8. Should people avoid contact with camels or camel products? Is it safe to visit farms, markets, or camel fairs?

- As a general precaution, anyone visiting farms, markets, barns, or other places where animals are present should practice general hygiene measures. These include regular hand-washing before and after touching animals, and avoiding contact with sick animals.
- The consumption of raw or undercooked animal products, including milk and meat, carries a high risk of infection from a variety of organisms. Animal products processed appropriately through cooking or pasteurization are safe for consumption, but should also be handled with care to avoid cross-contamination with uncooked foods. Camel meat and camel milk are nutritious products that can be consumed after pasteurization, cooking, or other heat treatments.
- Until more is understood about MERS-CoV, people with diabetes, renal failure, chronic lung disease, and immunocompromised persons are considered to be at high risk of severe disease from MERS-CoV infection. Especially in the Middle East, this group of people should avoid contact with dromedary camels, consuming raw camel milk or camel urine, as well as eating meat that has not been properly cooked.
- Camel farm and slaughterhouse workers should practice good personal hygiene, including frequent hand washing, facial protection, and protective clothing (which should be removed after work and washed daily). Workers should also avoid exposing family members to soiled work clothing, shoes, or other items that may have come into contact with camels or camel excretions. Sick animals should never be slaughtered for consumption.
- People should avoid direct contact with any animal that has been confirmed positive for MERS-CoV infection.

9. Are there travel restrictions due to MERS-CoV?

WHO does not currently recommend restrictions on travel or trade with regard to MERS-CoV. National authorities may take precautions to raise awareness of MERS-CoV and its symptoms among travellers, however, based on their own local risk assessment.

Source:https://www.who.int/news-room/questions-and-answers/item/middle-east-respiratory-syndrome-coronavirus-(mers-cov)

LIST OF CONTRIBUTORS

BAHAGIAN KAWALAN PENYAKIT (BKP)

1. Datuk Dr Norhayati Bt Rusli
Pakar Perubatan Kesihatan Awam
Timbalan Ketua Pengarah Kesihatan (Kesihatan Awam)
Kementerian Kesihatan Malaysia

2. Dr Thilaka a/p Chinnayah
Pakar Perubatan Kesihatan Awam
Cawangan Kesiapsiagaan, Survelan Dan Respon
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

3. Dr Zainal Abidin bin Abu Bakar
Pakar Perubatan Kesihatan Awam
Sektor Survelan Penyakit
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

4. Dr Siti Nor Binti Mat
Pakar Perubatan Kesihatan Awam
Sektor Survelan Penyakit
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

5. Dr Aznida Binti Mohamad Zaki
Pakar Perubatan Kesihatan Awam
Sektor Survelan Penyakit
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

6. Dr Musalnizan Binti Mustalkah
Pakar Perubatan Kesihatan Awam
Sektor Survelan Penyakit
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

7. Dr Rohani Binti Jahis
Pakar Perubatan Kesihatan Awam
Sektor Kawalan Zoonosis
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

8. Dr Norita Binti Shamsudin
Pakar Perubatan Kesihatan Awam
Sektor Kawalan Zoonosis
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

9. Dr Salmiah Binti Baharudin
Pakar Perubatan Kesihatan Awam
Sektor Peraturan Kesihatan Antarabangsa Dan Kesihatan Pengembaraan
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

10. Dr Norhasliza binti Abu Bakar Pakar Perubatan Kesihatan Awam
Sektor Peraturan Kesihatan Antarabangsa Dan Kesihatan Pengembaraan
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

11. Dr Tan Seok Hong
Pakar Perubatan Kesihatan Awam
Sektor Pengurusan Bencana, Wabak, Krisis Dan Kecemasan
Bahagian Kawalan Penyakit Kementerian Kesihatan Malaysia

12. Dr Maheshwara Rao A/L Appannan
Pakar Perubatan Kesihatan Awam
Sektor Pengurusan Bencana, Wabak, Krisis Dan Kecemasan
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

13. Dr Priya A/P Ragunath
Pakar Perubatan Kesihatan Awam
Ketua Sektor Kesihatan Pekerjaan Dan Alam Sekitar
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

14. Dr Nik Khairol Reza Bin Md Yazin
Pakar Perubatan Kesihatan Awam
Sektor Kesihatan Pekerjaan Dan Alam Sekitar
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

15. Dr Puganeswary A/P Thangarajah
Pakar Perubatan Kesihatan Awam
Sektor Kesihatan Pekerjaan Dan Alam Sekitar
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

16. Dr Tharani a/p Selvendran
Pegawai Perubatan
Sektor Peraturan Kesihatan Antarabangsa Dan Kesihatan Pengembaraan
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

17. Dr Nurathirah Bt Senin
Pegawai Perubatan
Sektor Survelan Penyakit
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

18. Puan Kartini Binti Kamarudin
Penolong Pegawai Kesihatan Persekitaran
Sektor Survelan Penyakit
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

BAHAGIAN PERKEMBANGAN PERUBATAN (BPP)

1. Dato' Dr Suresh Kumar a/l Chidambaram
Pakar Perunding Penyakit Berjangkit
Jabatan Perubatan
Hospital Sungai Buloh

2. Dr Benedict Lim Sim Heng
Pakar Perunding Perubatan dan Penyakit Berjangkit
Jabatan Perubatan
Hospital Sungai Buloh

3. Dr Khairil Erwan bin Khalid
Pakar Perunding Perubatan dan Penyakit Berjangkit
Jabatan Perubatan
Hospital Kuala Lumpur

4. Dr Pei Wei Kee
Pakar Intensivis
Jabatan Anestesiologi dan Rawatan Rapi
Hospital Kuala Lumpur

5. Dr Siti Suhaila binti Hamzah
Pakar Perubatan Kecemasan
Jabatan Kecemasan & Trauma
Hospital Sungai Buloh

6. Dr Sarah binti Sheikh Abd Karim
Pakar Perubatan Kecemasan
Jabatan Kecemasan & Trauma
Hospital Sungai Buloh

7. Dr Suraya Hanim binti Abdullah Hashim
Pakar Perubatan Penyakit Berjangkit
Jabatan Perubatan
Hospital Ampang

8. Dr Yasmin Mohamed Ghani
Pakar Perubatan Penyakit Berjangkit
Jabatan Perubatan
Hospital Sungai Buloh

9. Dr. Mohammad Shafie Bin Othman@Osman
Pakar Perubatan Forensik
Jabatan Forensik
Hospital Raja Permaisuri Bainun

10. Dr Shahanizan binti Mohd Zin
Ketua Penolong Pengarah Kanan
Cawangan Perkembangan Perkhidmatan Perubatan - Unit Perkhidmatan Perubatan
Bahagian Perkembangan Perubatan
Kementerian Kesihatan Malaysia

11. Dr Suraya Amir Husin
Ketua Penolong Pengarah Kanan
Ketua Unit Kawalan Infeksi
Cawangan Kualiti Penjagaan Perubatan
Bahagian Perkembangan Perubatan
Kementerian Kesihatan Malaysia

12. Dr Nur Shaheera Binti Shaharuddin
Ketua Penolong Pengarah Kanan
Cawangan Perkembangan Perkhidmatan Perubatan - Unit Perkhidmatan Perubatan
Bahagian Perkembangan Perubatan
Kementerian Kesihatan Malaysia

13. Dr Nor Farah Bakhtiar
Ketua Penolong Pengarah Kanan
Cawangan Kualiti Penjagaan Perubatan - Unit Kawalan Infeksi
Bahagian Perkembangan Perubatan
Kementerian Kesihatan Malaysia

14. Dr Mohd Sharil Alif bin Md Tajuddin
Cawangan Perkembangan Perkhidmatan Perubatan – Unit Perkhidmatan Kecemasan & Pengurusan Bencana
Bahagian Perkembangan Perubatan
Kementerian Kesihatan Malaysia

BAHAGIAN PEMBANGUNAN KESIHATAN KELUARGA (BPKK)

1. Dr Noor Haslinda Bt Ismail
   Pakar Perubatan Kesihatan Awam
   Bahagian Pembangunan Kesihatan Keluarga
   Kementerian Kesihatan Malaysia

2. Dr Azah binti Abdul Samad
   Pakar Perubatan Keluarga
   Klinik Kesihatan Seksyen 7 Shah Alam
   Pejabat Kesihatan Daerah Petaling

3. Dr Siti Aisyah Abd Majid
   Pakar Perubatan Keluarga
   Klinik Kesihatan Sungai Buloh
   Pejabat Kesihatan Daerah Gombak

4. Dr Noraini Jali
   Pakar Perubatan Keluarga
   Klinik Kesihatan Sungai Besar
   Pejabat Kesihatan Daerah Sabak Bernam

5. Dr Santhi A/P Armugam
   Pegawai Sains Kimia Hayat
   Bahagian Pembangunan Kesihatan Keluarga
   Kementerian Kesihatan Malaysia

MAKMAL KESIHATAN AWAM KEBANGSAAN (MKAK)

1. Dr Maria Suleiman
   Pakar Perubatan Kesihatan Awam
   Makmal Kesihatan Awam Kebangsaan
   Kementerian Kesihatan Malaysia

2. Dr Donal Huda Bt Nasril
   Pakar Patologi (Mikrobiologi Perubatan)
   Makmal Kesihatan Awam Kebangsaan
   Kementerian Kesihatan Malaysia

3. Dr Nor Zahrin Binti Hasran
   Pakar Perubatan Kesihatan Awam
   Makmal Kesihatan Awam Kebangsaan
   Kementerian Kesihatan Malaysia

4. Dr Sahlawati Mustakim
   Pakar Patologi (Mikrobiologi Perubatan)
   Hospital Sungai Buloh

5. Dr Tengku Norita Tengku Yazid
   Pakar Patologi
   Hospital Selayang

6. Dr Suhaila Baharuddin
   Pakar Patologi (Mikrobiologi Perubatan)
   Hospital Seremban

7. Dr Suhaila Hanapiah
   Pakar Patologi (Mikrobiologi Perubatan)
   Institut Kanser Negara

8. Dr Ravindran Thayan
   Ketua Pusat Penyelidikan Penyakit Berjangkit
   Institut Penyelidikan Perubatan (IMR)

9. Dr Rozainanee Mohd Zain
   Pakar Patologi (Mikrobiologi Perubatan)
   Institut Penyelidikan Perubatan (IMR)

10. Selvanesan a/l Sengol
    Pegawai Sains (Mikrobiologi)
    Makmal Kesihatan Awam Kebangsaan

11. Amrish Shah Othman
    Pegawai Sains (Mikrobiologi)
    Makmal Kesihatan Awam Kebangsaan

12. Pn Tg Rogayah Tg Abd Rashid
    Pegawai Penyelidik
    Institut Penyelidikan Perubatan (IMR)

WAKIL NEGERI

1. Dr Wan Noraini Binti Wan Mohamed Noor
   Pakar Perubatan Kesihatan Awam
   Timbalan Pengarah Kesihatan Negeri (KA)
   Jabatan Kesihatan Negeri Selangor

2. Dr Harishah Binti Talib
   Pakar Perubatan Kesihatan Awam
   Pejabat Kesihatan Daerah KLIA
   Jabatan Kesihatan Negeri Selangor

3. Dr. Faridah Binti Kusnin
   Pakar Perubatan Kesihatan Awam
   Unit Kawalan Penyakit Berjangkit
   (SURVELAN)
   Jabatan Kesihatan Negeri Selangor

4. Dr Azmi Bin Abdul Rahim
   Pakar Perubatan Kesihatan Awam
   Pejabat Kesihatan Daerah
   Pelabuhan Klang
   Jabatan Kesihatan Negeri Selangor

5. Dr. Rosvinder Singh A/L Harter Lochan Singh
   Pakar Perubatan Kesihatan Awam
   Cawangan Survelan
   Jabatan Kesihatan Wilayah Persekutuan
   Kuala Lumpur & Putrajaya

EDITORS **:** Dr Siti Nor Binti Mat
Pakar Perubatan Kesihatan Awam
Sektor Survelan Penyakit
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

Dr Aznida Binti Mohamad Zaki
Pakar Perubatan Kesihatan Awam
Sektor Survelan Penyakit
Bahagian Kawalan Penyakit
Kementerian Kesihatan Malaysia

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