وزارة الصحة
Ministry of Health

وقاية
هيئة الصحة العامة
PUBLIC HEALTH AUTHORITY

Coronavirus Disease COVID-19 Guidelines

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CONTENTS

1. Abbreviations

ACH	Air changes per hour
AGP	Aerosol generating procedures
AIIR	Airborne infection isolation rooms
ART	Antigen rapid test
BSC	Biological safety cabinet
BSL	Biosafety level
CAD	Coronary artery disease
CAP	Community acquired pneumonia
CoV	Corona viruses
ECMO	Extracorporeal membrane oxygenation
HAP	Hospital acquired pneumonia
HCW	Healthcare worker
HEPA	High efficiency particulate air
HESN	Health electronic surveillance network
HIV	Human immunodeficiency virus
ICTV	International Committee on Taxonomy of Viruses
ICU	Intensive care unit
IPC	Infection and prevention control
MERS	Middle east respiratory syndrome
MOH	Ministry of Health
PAPR	Powered air-purifying respirator
PCR	Polymerase chain reaction
PHA	Public Health Authority
PPE	Personal protective equipment
RDT	Rapid diagnostic test
RNA	Ribonucleic acid
RT-PCR	Reverse transcription polymerase chain reaction
SARI	Severe acute respiratory infection
SARS	Severe acute respiratory syndrome
SFDA	Saudi Food and Drug Authority
SOB	Shortness of breath
SOP	Standard operating procedures
VOC	Variants of concern
VOI	Variants of interest
VTM	Viral transport medium
WHO	World Health Organization

2. SCOPE AND PURPOSE

This guideline is intended for health care practitioners, and those involved in planning and delivering health services. It provides guidance on different aspects of COVID-19 management. Moreover, the guidelines provide recommendations about care in all settings for adults and children with suspected, clinically diagnosed, or laboratory-confirmed COVID-19.

3. INTRODUCTION

Coronaviruses (CoV) are a large family of RNA viruses that cause illnesses ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). The new strain of coronavirus was identified in December 2019 in Wuhan city, Hubei province of China, and has been named by the International Committee on Taxonomy of Viruses (ICTV) as Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV-2). The ICTV have determined that SARS-CoV-2 is the same species as SARS-CoV but a different strain. The World Health Organization (WHO) has named the disease associated with SARS-CoV-2 infections as Corona “COVID-19”. Since the emergence of the 2019 novel coronavirus (2019- nCoV) infection in Wuhan, China, in December 2019, it has rapidly spread across China and more than 200 other countries. Most of the cases involved in the first cluster in December 2019 were linked to the large Wuhan Seafood Market.

The original source(s) of SARS-CoV-2 transmission remain unidentified. However, available genetic and epidemiological data suggest that SARS-CoV-2 is a zoonotic pathogen with possible spillover directly from wildlife or via intermediate animal hosts or their products. Sustained human-to-human transmission has been confirmed in China where numerous healthcare workers have been infected in clinical settings with overt clinical illness and fatalities. Most cases have been associated with fever and respiratory symptoms (coughing and shortness of breath), while other cases are mild or subclinical cases.

4. OBJECTIVES

Based on the best available scientific evidence, the objectives of this document are:

- Provide guidance on COVID-19 surveillance in healthcare and community settings.
- Enhance rapid detection of confirmed cases/clusters of COVID-19
- Determine clinical and epidemiological characteristics of the COVID-19 infection.
- Provide guidance on infection prevention and control (IPC) practices to be implemented when managing suspected and confirmed COVID-19 cases.
- Standardize the clinical management of COVID-19 patients.
- Provide guidance for rational use of resources including laboratory testing.
- Serve as a quality control/audit tool for COVID-19 surveillance and prevention program.

5. SURVEILLANCE CASE DEFINITIONS

5.1 Definition of COVID-19 Suspected Cases

Clinical Presentation	Criteria
1. Patient with acute respiratory illness (sudden onset of at least one of the following: fever[1] (measured or by history), cough, or shortness of breath	**Not required**
2. Patient with sudden onset of at least one of the following: headache, sore throat, rhinorrhea, nausea, diarrhea or loss of smell or taste. **AND** in the 10 days prior to symptom onset, met at least one of the following criteria	• Had contact[2] with a confirmed COVID-19 case. **OR** • Working in or attended a healthcare facility where patients with confirmed COVID-19 were admitted.
3. Any admitted adult patient with unexplained sever acute respiratory infection (SARI), either Community Acquired Pneumonia (CAP) or Hospital Acquired Pneumonia (HAP).	**Not required**

5.2 Definition of COVID-19 Confirmed Cases

A person who meets suspected case definition AND tested positive by a Rabid Diagnostic test (RDT)* or nucleic acid amplification test (PCR)**.

*RDT kit: authorized by SFDA and validated by Public Health Authority.

**PCR: a certified clinical laboratory which is authorized by Public Health Authority.

[1] Fever is frequently reported (77–98%) but elderly and people with severe comorbidities may not mount fever initially.

[2] Contact is defined as anyone with any of the following exposures:
- Being within 1.5 meter of a confirmed COVID-19 case for >15 minutes.
- Direct physical contact with a confirmed COVID-19 case;
- Providing direct care for a confirmed COVID-19 patient without using proper personal protective equipment (PPE).
- Living in the household with a confirmed COVID-19 case.
- Sharing a room, meal, or other space with a confirmed COVID-19 case.
- Sitting within 2 rows (in any direction) of a confirmed COVID-19 case for >15 minutes and any crew in direct contact with the case in a public or shared transportation.

5.3 COVID-19 Reinfection:

Reinfection means an individual became infected again after he recovered. This can occur multiple times. Most of the cases are mild, but also the severe illness can occur. The new variants have the ability to escape an individual's existing immunity and cause an increased risk of reinfection. Moreover, as a history of prior infection increases and immunity from prior infection or vaccination decreases over time, the risk of reinfection will increase.

5.3.1 Definition of COVID-19 Reinfection:

Time Frame	Criteria	Surveillance definition	instructions
At any time	• Symptomatic (Fever, worsening cough, SOB) • If isolated virus found by **gene sequencing** different from previous infection isolate.	**Confirmed case of Reinfection**	Manage it as confirmed case.
More than or equal to 90 days	• Symptomatic (Fever, worsening cough, SOB) • a case that tests positive (RDT or PCR).	**Presumed Reinfection**	Manage it as confirmed case.
Less than 90 days	• Symptomatic (Fever, worsening cough, SOB)	**Previous infection**	Rule out the other possible causes.

6. INFECTION PREVENTION AND CONTROL (IPC)

The principles of infection prevention and control strategies associated with health care with suspected COVID-19 are:

- Early recognition and source control.
- Application of standard precautions for all patients.
- Implementation of empiric additional precautions.
- Management of exposure to COVID-19 in healthcare facilities
- Transportation of suspected and confirmed COVID-19 patients.
- Administrative controls.
- Environmental and engineering controls.
- Collection and handling of laboratory specimen.
- Environmental cleaning and disinfection after a COVID-19.
- Infection control in radiological examination for COVID-19.

6.1 Early Recognition and Source Control

- Encourage HCWs to have a high level of clinical suspicion.
- Activation of respiratory triage (see Appendix 5).
- Post signage reminding symptomatic patients to alert HCWs.
- Promotion of respiratory hygiene is an important preventative measure.
- Suspected COVID-19 patients should be placed in an area separate from other patients, and additional Infection Prevention and Control IPC (droplet and contact) precautions promptly implemented

6.2 Application of Standard Precautions for all Patients

Standard Precautions Include:

- Universal masking of all HCWs, patients and visitors in is highly recommended mainly in the high risk area such as ICU, ER , or isolation rooms (please follow the updated instruction of MoH or PHA regarding Universal masking)
- Correct and consistent use of available PPE and appropriate hand hygiene.
- Perform hand hygiene after contact with respiratory secretions.
- PPE effectiveness depends on adequate and regular supplies and proper selection, use of PPE.
- Ensure that environmental cleaning and disinfection procedures are followed consistently and correctly. Thorough cleaning of environmental surfaces with water and detergent and applying commonly used hospital level disinfectants (such as sodium hypochlorite) is an effective and sufficient procedure.
- Manage laundry, food service utensils and medical waste in accordance with safe routine procedures.
- prevention of needle-stick or sharps injury

Ensure the Following Respiratory Hygiene Measures:

- Universal masking of all HCWs, patients and visitors is highly recommended mainly in the high risk area such as ICU, ER, or isolation room (please follow the updated instruction of MoH or PHA regarding Universal masking)
- Cover nose and mouth during coughing or sneezing with tissue or flexed elbow for others.

6.3 Implementation of Empiric Additional Precautions

6.3.1 Contact and Droplet Precautions for Suspected COVID-19

In addition to Standard Precautions, all individuals, including family members, visitors and HCWs should apply Contact and Droplet precautions. Standard precautions should always be applied at all times.

- Place patients in adequately ventilated single rooms.
- It is preferred and strongly recommended not to cohort suspected COVID-19 patients because it carries a risk of transmission of infection between patients if one of them will be confirmed.
- In cases of severe shortage of single rooms, it is possible to cohort suspected COVID-19 patients together with strict adherence to the following standards:
  a. One patient only should be admitted in each multibed room, then another patient will be put to bed far from the first patient's bed, and so on until the need to admit patients in all the beds of the room.
  b. There must be a physical separation between the patients' beds (single use curtains – mobile or fixed partitions) and in the event of unavailability the distance between the bed and the other, distance should not be less than 1.5 meter.
  c. It is strictly forbidden to implement aerosol-generating procedures (AGPs) such as respiratory suctioning and nasopharyngeal swabbing in these cohort rooms, the patient should be directed to a single room.
  d. If the mobile HEPA filter devices are available, a device can be placed between each of two beds.
- Strict adherence by health care workers to infection control practices, hand hygiene between patients, new gloves between patients, wearing new set of personal protective equipment if the worn set become visibly soiled.
- Never share the patient care equipment between patients and it is preferable if available to use single use equipment.

- Patients should be asked to wear surgical mask throughout their hospitalization period, they are required not to move in the rooms between beds and corridors.
- Use a surgical mask with an eye/facial protection (i.e., goggles or a face shield).
- Use gloves and a clean, non-sterile, long-sleeved fluid resistant isolation gown.
- Remove your PPE after caring for a patient in a proper way then dispose it, after that hand hygiene must be performed. New set of PPEs' is needed when care is given to a different patient.
- Use either single use disposable equipment or dedicated equipment (e.g., stethoscopes, blood pressure cuffs and thermometers). If equipment needs to be shared among patients, clean and disinfect between each patient use (e.g., ethyl alcohol 70%).
- Refrain from touching eyes, nose, or mouth with potentially contaminated hands.
- Avoid the movement and transport of patients out of the room or area unless medically necessary.
- Use designated portable X-ray equipment and/or other important diagnostic equipment. With cleaning between patients
- If transport is required:
  - Notify the receiving area of necessary precautions as soon as possible before the patient's arrival.
  - Use pre-determined transport routes (get help from security) to minimize exposures to staff and to others and apply surgical mask to patient.
  - Transferred patient should not wait in the waiting or recovery room.
  - Isolation signage should be hanged to the patient transportation equipment.
  - Ensure that HCWs who are transporting patients wear appropriate PPE as described in this section and perform hand hygiene.
  - Routinely clean and disinfect patient-contact surfaces with MOH approved disinfectant.
- Limit the number of HCWs, family members and visitors in contact with a patient with suspected COVID-19 infection.
- Maintain a record of all persons entering the patient's room including all staff and visitors including communication tools like mobile no.

6.3.2 Airborne Precautions for Aerosol-generating Procedures for Suspected COVID-19

Some aerosol generating procedures have been associated with increased risk of transmission of coronaviruses (SARS-CoV and MERS-CoV) such as nasopharyngeal swabbing, tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before Intubation and bronchoscopy. HCWs performing aerosol-generating procedures should note the following:

- Use a fit tested particulate respirator.
- Always perform the seal-check when putting on a disposable particulate respirator.
- For nasopharyngeal swabbing, in case of non-availability of respirators the HCW can use surgical mask and face shield during the process.
- HCW that all available types of respirators are not fit to him should be avoided from aerosol-generating procedures or use PAPR (Powered Air-Purifying Respirator).
- Facial hair (beard) prevents proper respirator fit; either avoid aerosol-generating procedures or use PAPR.
- Use eye protection (i.e., goggles or a face shield).
- Clean, non-sterile, long-sleeved isolation gown and gloves are used, if gowns are not fluid resistant, use a waterproof apron for procedures with expected high fluid volumes that might penetrate the gown.
- Perform procedures in negative pressure rooms with at least 12 air changes per hour (ACH) and controlled direction of air flow when using mechanical ventilation.
- In case of unavailability of negative pressure room, nasopharyngeal swab could be taken in well-ventilated single room with portable HEPA filter.
- Limit the number of persons present in the room to the absolute minimum required for the patient's care and support.

6.3.3 Choosing Appropriate Respiratory Protection

- Adhering to appropriate infection control measures is crucial in protecting HCWs from secondary infection.
- In certain situation such as caring for suspected or confirmed cases of COVID-19 in poor ventilated areas, higher respiratory protection (high efficacy respirators) is preferred if available.
- Selection of high efficacy respirators should be based on the fit-test.

6.4 Management of Exposure to COVID-19 in Healthcare Facilities

6.4.1 Healthcare Workers Exposed to a COVID-19 Case

- Healthcare facilities should identify and trace all healthcare workers who had exposed to confirmed COVID-19 case and identify the risk category according to the **"Management of Healthcare Workers Exposed to COVID-19"** guide.

6.4.2 Patients Exposed to a COVID-19 Case

- Patients can be exposed to COVID-19 patients prior to diagnosis or due to the failure of implementing recommended isolation precautions.
- The following are general guidelines, but management will depend on the infection control team risk assessment.
- Patients sharing the same room (any setting e.g. Ward with shared beds, open ICU, open emergency unit etc.) with a confirmed case of COVID-19 for at least 15 minutes and patient developed symptoms:
  - Patient should be tested for COVID-19 by RDT.
  - If positive, patients should be managed as confirmed COVID019 case.

6.5 Transportation of Suspected and Confirmed COVID-19 Patients Outside the Facility.

Patients, suspected or confirmed, will have to be moved safely between their homes to a health care facility as well as from health care facilities to dedicated COVID-19 management facilities. Acknowledging the challenges vehicular transportation of such patients pose including vehicle contamination and infection transmission, safe transfer is possible if the following recommendations are followed:

a) There should be arrangement between the transporting facility and the receiving facility for transportation timing, personal and clinical information.
b) The patient should be masked with surgical mask during transportation.
c) The patient must be health educated about respiratory etiquette.
d) The driver should wear surgical mask during transportation.
e) Never transport suspected with confirmed COVID-19 in one vehicle.
f) The used vehicle should be disinfected using MOH approved disinfectant (quaternary ammonium chloride wipes or spray / freshly prepared sodium hypochlorite solution 1000 ppm).

6.5.1 Precautions During Patient Transport by Ambulance

- Ambulance staff that handles the suspected/confirmed cases recommended to be vaccinated with the updated COVID-19 vaccine.
- For additional staff protection, the number of ambulance staff in the patient section of the ambulance should be restricted to the minimum required.
- Ambulance staff should notify the receiving healthcare facility that the patient has an exposure history and signs and symptoms suggestive of COVID-19 so that appropriate infection control precautions may be taken prior to patient arrival.
- It is best to limit contact with patient contact. patient should be asked to wear facemask (if possible) is placed on him/her, this facemask reduces the ability of the patient to contaminate the immediate working environment of the ambulance staff.
- Oxygen delivery with a non-rebreather face mask may be used to provide oxygen support during transport. If needed, positive-pressure ventilation should be performed using a resuscitation bag-valve mask, preferably one equipped to provide HEPA or equivalent filtration of expired air.
- To the extent possible, staff should ensure patients are isolated from other patients. This includes not allowing family members and other contacts to accompany suspected and confirmed COVID-19 patients in the ambulance. However, if they accompany the patient, they must wear a facemask.
- In patients with nasal cannula in place, the facemask should be fixed over the cannula. It is also possible to use an oxygen mask when indicated.
- Ambulances with isolated driver and patient sections providing independent ventilation to each area is preferred. To assure driver isolation from the patient section, keep connecting doors and windows closed before bringing the patient into the ambulance.
- During the journey, ensure that ventilation in both sections are in the non-recirculated mode in order to optimize changes thereby reducing the presence of potentially infectious particles in the ambulance. Ambulances with rear exhaust fans can use it to remove air from the vehicle at the back. The use of It is preferable to use an ambulance fitted a HEPA filter coupled ventilator when transporting patients on mechanical ventilators.
- To use the ventilation in ambulances lacking a physically isolated driver section, open the outside air vents in the driver section should be

opened and the rear exhaust ventilation fans turned on to the highest setting. This generates a negative pressure gradient in the patient area.

- The ambulance staff should complete the handing over process at the destination health care facility following standard procedures.
- Additional recommendations for aerosol-generating procedures can be found in section 6.3.2 (Airborne precautions for aerosol-generating procedures for suspected COVID-19)

6.5.2 Recommendations on Personal Protective Equipment (PPE) use

- Ambulance staff providing care for or accompanying suspected or confirmed COVID-19 patients in the patient section of the ambulance should adhere to standard and transmission-based precautions including required PPE.
- In situations where personnel driving ambulances used to transport patients are involved in moving patients onto stretchers or other forms of direct care, it is recommended that they strictly use recommended PPE (including N95 mask and googles). They should appropriately doff and dispose their PPE and perform hand hygiene after completing patient care and prior to re-entering the isolated driver's section. This will prevent contamination of the cubicle.
- In situations where the ambulance/vehicle lacks an isolated driver's section, it is recommended that the driver use a respiratory/face mask during transport. However, he should remove his face shield or goggles, gown and gloves and perform hand hygiene.
- Ambulance staff should avoid touching their faces while working.
- Upon arrival at the health care facility and following patient hand over ambulance staff should doff and discard PPE and perform hand hygiene. They should discard used PPE following standard MOH procedures.

6.5.3 Recommendations Relating to Patients Care Documentation.

- Only after the ambulance staff have completed patient hand over, PPE doffing and hand hygiene should they proceed to patient care documentation.
- The documentation should include a listing of all the HCWs that provided care for the patient (direct or indirect) and the level of contact.

6.5.4 Recommendations Regarding Cleaning Ambulances after Transporting of suspected or Confirmed COVID-19 Case

- Once the patient has been handed over at the designated receiving health care facility, the ambulance should be aerated with several cycles of air changes by leaving its rear doors open. This will get rid of possibly infected particles.
- After patient transfer, terminal cleaning should be done using manual method and /or hydrogen peroxide dry mist or vapor.
- Prior to cleaning the ambulance, staff should don disposable gowns and gloves. Eye/face protection PPE (goggles, face shields or facemasks) are recommended if the cleaning procedure will generate splashes or sprays.
- Environmental cleaning and disinfection should be carried out following procedures consistently and correctly. This includes assuring adequate ventilation when chemicals are used by keeping doors open.
- Routine cleaning and disinfection procedures (e.g., using cleaners and water to pre-clean surfaces prior to applying approved disinfectant to frequently touched surfaces or objects for appropriate contact times as indicated on the product's label) are appropriate for COVID-19 in healthcare settings, including those patient-care areas in which aerosol-generating procedures are performed.
- Following approved procedures, the ambulance must be cleaned and disinfected ensuring that all contaminated surfaces including stretcher, rails, control panels, floors, walls, and work surfaces are thoroughly cleansed approved disinfectant and in according to manufacturer's instructions.
- Clean and disinfect reusable patient-care equipment before use on another patient, according to manufacturer's instructions.
- Ambulance staff should keep to approved procedures for the containment and disposal of used PPE and regulated medical waste as well as laundering used linen. Avoid shaking the linen.

6.5.5 Recommendations to Ambulance Staff Post Care of a Suspected or Confirmed COVID-19 Patient: Follow-up/Reporting Procedures

- Ambulance staff should carry out follow-up/reporting measures required of them post care of a patient with suspected or confirmed COVID-19. Their supervisors should implement regulations requiring monitoring, excluding from work, etc. as

pertains to HCWs having potential exposure to COVID-19 patients.

- Ambulance staff are required to promptly inform their supervisor of exposures to a patient with confirmed COVID-19 who can ensure that appropriate action is taken.
- Ambulance staff are required to report any unprotected exposure to patient with confirmed COVID-19 (e.g., not donning recommended PPE, compromised or inappropriate PPE, etc.) to their supervisor or infection control for appropriate evaluation and action.
- Ambulance staff are required to monitor and report any fever or respiratory symptoms (e.g., cough, shortness of breath, sore throat). Upon developing symptoms, they should isolate themselves and inform their supervisor or infection control for appropriate evaluation and action. (More detailed recommendations on updated **Guideline of Management of Healthcare Workers Exposed to COVID-19)**.

6.6 Administrative Controls

- Establishment of sustainable IPC infrastructures and activities.
- Adequate staff training and specifically appropriate human behavior, and patients' care givers education.
- Vaccination coverage to all HCWs in the facility with prioritization to high risk groups.
- Staff that manages suspected/confirmed cases should be chosen based on their immunization status as much as possible.
- Policies on early recognition of acute respiratory infection potentially due to COVID-19.
- Access to prompt laboratory testing for identification of the etiologic agent.
- Prevention of overcrowding especially in the emergency department.
- Provision of dedicated waiting areas with clear signage of "Respiratory Waiting Area" for symptomatic patients and appropriate placement of hospitalized patients promoting an adequate patient-to-staff ratio.
- Provision and use of regular supplies.
- IPC policies and procedures for all facets of healthcare provisions with emphasis on surveillance of acute respiratory infection potentially due to COVID-19 among HCWs and the importance of seeking medical care.
- Monitoring of HCW compliance with standard precautions, along with mechanisms for improvement as needed.

6.7 Environmental and Engineering Controls

- Basic health-care facility infrastructures.
- Ensuring adequate environmental ventilation.
- Adequate environmental cleaning in all areas within the health-care facility.
- Terminal room cleaning at the time of discharge or transfer of patients.
- Physical separation of at least 1.5 meter distance should be maintained between each suspect patient and others.

6.8 Collection and Handling of Laboratory Specimens From Patients With Suspected COVID-19

- All samples collected for laboratory investigations should be regarded as potentially infectious.
- HCWs who collect or transport clinical specimens should adhere rigorously to Standard Precautions to minimize the possibility of exposure to pathogens.
- Ensure that HCWs who collect specimens use appropriate PPE (eye protection, surgical mask, long-sleeved gown, gloves).
- The respiratory specimen should be collected under aerosol generating procedure, personnel should wear a particulate certified N95 respirator.
- Ensure that all personnel who transport specimens are trained in safe handling practices and spill decontamination procedures.
- Place specimens for transport in leak-proof specimen bags (secondary container) that have a separate sealable pocket for the specimen (i.e. a plastic biohazard specimen bag), with the patient's name label on the specimen container (primary container), and a clearly written laboratory request form.
- Ensure that health-care facility laboratories adhere to appropriate biosafety practices and transport requirements according to the type of organism being handled.
- Deliver all specimens by hand whenever possible.
- **DO NOT** use pneumatic-tube systems to transport specimens.
- HESN PLUS Printed lab requisitions must be sent with samples and national lab reception report and result values must be updated on HESN PLUS on their corresponding time.

6.9 Environmental Cleaning and Disinfection After Suspected or Confirmed COVID-19 Patients in the Facility

- In-patient rooms (housing COVID-19 patients) should be cleaned and disinfected at least daily and at the time of patient transfer or discharge
- More frequent cleaning and disinfection may be indicated for high-touch surfaces and following aerosol producing procedures (e.g. tables, hard-

backed chairs, doorknobs, light switches, remotes, handles, desks, toilets, sinks)

- Cleaning staff should wear disposable gloves, surgical mask and isolation gowns for all tasks in the cleaning process, including handling of waste.
- Cleaning and disinfection of the environmental surfaces should be with approved MOH disinfectant e.g. Hydrogen peroxide, quaternary ammonium chloride 4th generation, freshly prepared sodium hypochlorite solution 1000 ppm with consideration to the contact time in accordance with manufacturer's instructions for environmental surface disinfection.
- After patient transfer, terminal cleaning should be done using manual method and /or ultraviolet germicidal irradiation or hydrogen peroxide dry mist or vapor.

6.10 Infection Control in Radiological Examination for Suspected or Confirmed COVID-19 Cases

- Chest X-ray for patients with suspected/confirmed COVID-19 should be done at the patient room with portable machine (as possible as we can) to limit transportation of patients which may increase the risk of transmission of infection.
- Imaging patients with suspected/confirmed COVID-19 should only be considered for emergent situations
- Transmission based Precautions of contact, droplet and/or airborne infection should be applied with suspected/confirmed COVID-19 patients depending on patient status and the procedure.
- Portable radiographic machines should be used as possible as we can to limit transportation of patients which may increase the risk of transmission of infection.
- Dedicated portable x-ray machine for isolation wards, ER (one for each unit) to minimize the risk of spread of infection and when available, use cassette/detector single use/disposable covers to minimize risk of spread of infection.
- It should be highlighted in the imaging request that the patient is suspected or confirmed COVID-19.
- The radiology technician should be trained from infection control department about standard and transmission-based precautions especially hand hygiene, proper selection and use of PPE.
- Portable machine should be disinfected after each use with approved MOH disinfectant and according to the manufacturer recommendations.

6.10.1 Infection control for suspected or confirmed COVID-19 in the Radiology Department

- If the portable machine is not available or cases requested for static machines and/or advanced imaging/procedure, (e.g. CT scan, MRI, IR, etc.), the referring physician should discuss the case with the radiology consultant and infection control department before sending the patient for imaging.
- The patient should be directly taken into the modality room without delay and should not be waiting in general waiting areas of the department.
- The modality scan area should be clear of other patients and/or unnecessary staff.
- Items/equipment that are not needed in the examination should be cleared.
- Radiology staff should don the necessary PPE when dealing with the patient and doff them after the finish of the process.

7. LABORATORY DIAGNOSIS

7.1 Specimen Collection and Shipment of COVID-19

All staff who will be handling the COVID-19 samples should be trained for appropriate collection, packaging, transportation, analysis, and specimen storage. When collecting the specimen, avoid sample contamination and follow the instructions and adhere to infection control measures and wear appropriate PPE as described in section 6.2 It is advised to have sufficient quantity of sample in case of repeating the test or preforming further characterization. Follow the appropriate precautions for safety during collection and processing of samples.

7.2 Laboratories to Perform Diagnostic Testing

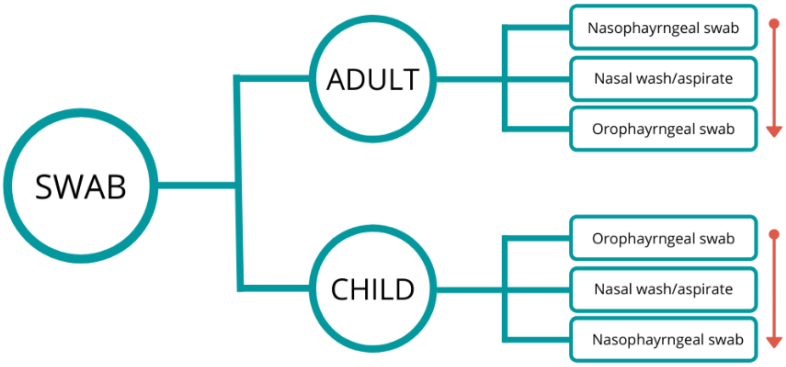
- Testing is limited to qualified laboratories with a certified Class II Biological Safety Cabinet (BSC) in a Biosafety Level 2 (BSL-2) facility and those designated by the Public Health Authority.
- Ensure that the laboratory have all the required standard operating procedures (SOP) in place and that laboratory staff are trained in all relevant procedures.
- To provide diagnostic testing for COVID-19, the laboratory can perform RDT or RT-PCR testing using test approved by the Public Health Laboratory.

- For the public health surveillance of the COVID-19 variant, PCR should be performed for all admitted patients or for patients who have a recent history of travel, in addition to other criteria based on updated directions from the MoH and PHA.
- Virus isolation from samples collected from positive cases or patients suspected to have COVID-19 should only be done in a BSL-3 facility and require special trained staff to perform procedures involving viral isolation.

7.3 Samples to be Collected.

a. Lower respiratory tract samples: including endotracheal aspirate, Broncho alveolar lavage fluid or sputum.
b. Upper respiratory tract samples:
   i. Sample collection in adults:
      - Whenever feasible, nasopharyngeal swab should be the first choice when collecting samples.
      - If nasopharyngeal swab is not feasible, nasal wash/aspirate can be considered.
      - Oropharyngeal swab can be used when both previous options aren't feasible.

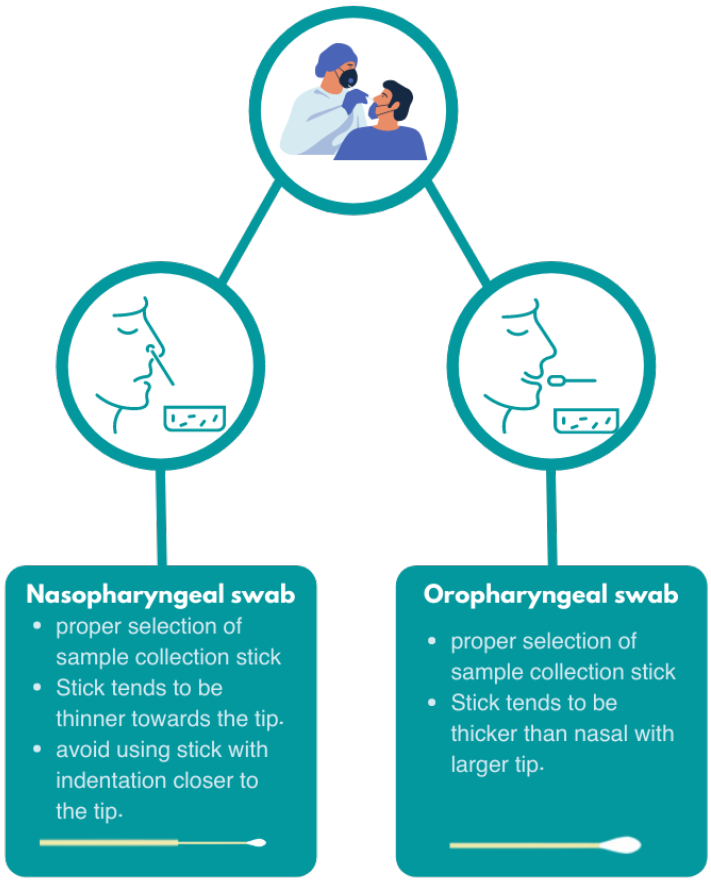
   ii. Sample collection in children (<12 years old):
      - Oropharyngeal swab should be considered.
      - If not feasible, nasal wash/aspirate can be considered.
      - If not feasible, nasopharyngeal swab can be considered (only flexible nasopharyngeal swab should be used)



- The lower respiratory tract samples are preferred if patient have signs or symptoms of lower respiratory tract infection. If lower

tract specimens are not possible or clinically indicated, upper respiratory samples should be collected.

- Repeat testing should be performed if initial testing is negative and there is a high index of suspicion. Patients should be retested using a lower respiratory sample or, if not possible, repeat collection of a nasopharyngeal sample.
- In HESN PLUS you can register the case, for test requested select COVID-19, and select the designated laboratory.
- HESN PLUS request form is to be completed and must be attached with sample.
- A single negative test result, especially from upper respiratory tract sample, does not rule out the infection.
- Negative RDT or negative RT-PCR results must be interpreted in correlation with clinical findings, history, and other diagnostic procedures. As poor quality of the specimen, time of collection during the course of the disease, shipment and shipment condition, some RDT or RT-PCR infection with SARS-CoV-2. However, it does not rule out co-infection with other pathogens.



* Disclaimer: follow the manufacture instruction while selecting proper VTM, shapes may vary according to different manufacturers

7.4 Notification and Result Reporting HESN PLUS

- All laboratories testing for COVID-19 are required to report all positive results immediately to the public health authorities through HESN PLUS.
- Samples with positive results from MOH, governmental non-MOH and private sectors should be sent to Public Health Laboratory, Public health Authority for further confirmation and characterization according to updated memo regarding to numbers and frequency.
- Store respiratory samples at 2-8°C and ship directly to Public Health Laboratory, Public Health Authority on ice pack.

7.5 Storage and Shipment of Samples

- Store samples at 2-8°C and ship on ice pack to Public Health Laboratory. Samples can be stored at 2-8°C for ≤48 hours, if longer storage is needed, samples should be stored at -70 °C. If sample is frozen at -70°C, ship on dry ice.
- Samples can be shipped free of charge via the courier, SMSA, following appropriate regulations. The courier service is available for sample transportation and pickup locations throughout the country for collection of samples from MOH hospitals and other Health care facilities. Specimens pick up can be requested from SMSA at the following number (8006149999)
- All specimens must be appropriately packaged.
- The courier will package and transport the samples in accordance with Category B transportation regulations and the WHO guidance on regulations for the transport of infectious substances 2019-2020.
- For detailed guidelines on sample collection, packaging, and shipping, please refer to MERS-CoV guidelines version 5.1 (Appendix E).

8. PUBLIC HEALTH CONSIDERATIONS

8.1 Reporting of COVID-19

The COVID-19 is a reportable disease as follow:

1. **All confirmed COVID-19 hospitalized cases** should be reported through **HESN PLUS** (immediate notification within 8 hours). Hospitalized case is any patient admitted to ICU or non-ICU ward in the hospital who fit the definition of a confirmed COVID-19.
2. **All confirmed COVID-19 deaths** should be reported through **HESN PLUS** (immediate notification within 8 hours).
3. For **SENTINELL SITES,** all suspected and confirmed cases should be reported through **EMFLU website**. The reporting includes all cases fulfilling the cases definition of COVID-19 in sentinel sites according to protocol of sentinel surveillance of respiratory disease.
4. The surveillance of COVID-19 included tracking variants of interest (VOIs) and variants under monitoring (VOCs). The selection of COVID-19 cases for gene sequencing in public health laboratory is based on criteria that regularly updated by PHA and MOH.
5. Currently, the selected cases included the cases with history of recent traveling abroad, ICU cases, hospital admitted cases (non-ICU), and deaths.

8.2 Risk Communication

Risk communication is integral to the success of response to any health emergency and possible outbreaks. During outbreaks, panics, rumors and misunderstandings are raising between people. Thus, risk communication helps prevent infodemics, alleviate confusion and avoid misunderstandings. Most important and effective interventions in a public health response to any event or outbreak is to proactively communicate and engage and share strategies with the community.

Ensure to update health care workers about COVID-19 status globally and in Saudi Arabia. The internal communication plan should be developed for communicating information about suspected or confirmed cases inside the facility. The assigned risk communication team should be formed with clear roles and responsibilities. The main role of the team is to understand the concerns, believes, behaviors, rights and duties during alert and outbreak phases. Announcement of cases will be among the spokesperson of MOH only. To avoid any panic or rumors among the public. The main official sources of COVID-19 information are the MOH and PHA.

8.3 Vaccination

For latest guidelines on vaccination refer to MOH and PHA latest guidelines.

9. CRITERIA FOR RECOVERY AND DISCONTINUING ISOLATION

IMMUNIZATION STATUS	PATIENT STATUS	INSTRUCTIONS*
Not fully immunized	Confirmed COVID19, **asymptomatic** patient ±	• Self-isolation period should not exceed more than 5 days since the date of collection of the respiratory sample with the first positive RDT or PCR result and based on the treating physician's decision. • The patient is recommended to continue wearing a mask after the isolation period until day 10. • If patient developed symptoms during the 10 days period after the first positive RDT or PCR result, consider the day symptoms started as day 1 and continue isolation as for (Confirmed case with mild symptoms)
Regardless of immunization status	Confirmed COVID-19 patient, with **mild symptoms and not immunocompromised**	• Self-isolation should start from the day symptoms appeared and should not exceed more than for 5 days with fever resolved for at least 24 hours without using fever reducing medication and based on the treating physician's decision. • The patient is recommended to continue wearing a mask after the isolation period until day 10.
	Hospitalized confirmed COVID-19 with **severe symptoms and not immunocompromised**	• Patient can be discharged before recovery based on clinical criteria, per evaluation of the treating physician. • Isolation is considered after the onset of symptoms and should not exceed 10 days based on the treating physician's decision.
	Hospitalized confirmed COVID-19 and **immunocompromised** patient regardless of symptoms severity**	• Patient can be discharged before recovery based on clinical criteria, per evaluation of the treating physician. • Isolation should not exceed 20 days after the onset of symptoms or since the date of collection of the respiratory sample with the first positive RDT or PCR result based on the treating physician's decision

*Self-Isolation for preventive purposes is recommended based on the treating physician's decision according to many criteria such as ,immunity status, persistence of the symptoms, comorbidity ,and high risk group.
± For fully immunized asymptomatic patient there is no further action needed.
**Neutropenia (absolute neutrophils count <500/mm3), leukemia or lymphoma, HIV with CD4 count < 200, Splenectomy, Early post-transplant, Cytotoxic chemotherapy, on high dose steroid therapy: >40 mg prednisone or its equivalent (>160 mg hydrocortisone, >32 mg methylprednisolone, >6 mg dexamethasone, >200 mg cortisone) daily for > 2 weeks.

10. MANAGING OF DECEASED BODIES

- Isolation precautions should be continued to the deceased COVID-19 case.
- Cadaver bags that fulfill MOH approved specifications should be used for transport of dead bodies of deceased COVID-19 patients and those handling the body at this point should use PPE (surgical mask, clean gloves, and isolation gown).
- The trolley carrying the body must be disinfected after transferring deceased body.
- Experienced morgue staff are preferred to deal with bodies of deceased COVID-19 patients, the morgue's staff should be well trained, familiar with standard precautions and transmission-based precautions while handling dead bodies, especially hand hygiene, safe and proper use of PPE.
- Morgue's staff should be informed about infectious status of the deceased, risk of infection and appropriate precautions required through use of morgue's transportation card attached to the dead body or to the bag about the disease and transmission-based precautions required.
- All persons performing or attending the body washing and preparation should wear PPE (surgical mask, isolation gown, and clean gloves) and should perform hand hygiene after removal of the gloves.
- If family members wish to perform the body washing, this should be under supervision and must strictly adhere to standard precautions and use PPE.
- The receiving facility should be informed by the disease, mode of transmission and precautions needed during body preparation.

10.1 Collection of Postmortem Upper Respiratory Tract Swab Specimens

Since collection of nasopharyngeal and oropharyngeal swab specimens from deceased persons will not induce coughing or sneezing, a negative pressure room or HEPA filter unit are not required.

The following PPE should be worn:

- Clean gloves.
- Wear heavy-duty gloves over the gloves, if there is a risk of cuts, or other injuries that break the skin.
- Clean, long-sleeved fluid-resistant or impermeable isolation gown.
- Face shield or goggles and face mask.

10.2 Autopsy Procedures

Standard Precautions, Contact Precautions, and Airborne Precautions with eye protection (e.g., goggles or a face shield) should be followed during autopsy.

- Aerosol Generating Procedures (AGPs) such as use of an oscillating bone saw should be avoided for confirmed or suspected cases of COVID-19. Consider using hand shears as an alternative cutting tool. If an oscillating saw is used, attach a vacuum shroud to contain aerosols.

- Allow only one person to cut at a given time.
- Limit the number of personnel working in the autopsy room at any given time to the minimum number needed to conduct the autopsy safely.
- Use caution when handling needles or other sharps and dispose of contaminated sharps in puncture-proof sharps containers.
- A logbook including names, dates, and activities of all workers participating in the postmortem and cleaning of the autopsy room should be kept assisting in future follow up, if necessary.

Engineering Control Recommendations

- Autopsies on dead body of known or suspected COVID-19 patient should be conducted in Airborne Infection Isolation Rooms (AIIRs).
- If an AIIR is not available, use a portable HEPA filter unit.
- Local airflow control (i.e., laminar flow systems) can be used to direct aerosols away from personnel. If use of an AIIR or HEPA filter unit is not possible, the procedure should be performed in the most protective environment possible.

PPE Recommendations

The following PPE should be worn during autopsy procedures:

- Double surgical gloves interposed with a layer of cut-proof synthetic mesh gloves.
- Fluid-resistant or impermeable gown
- Waterproof apron
- Goggles or face shield
- Certified fit tested N95. Otherwise, Powered Air-Purifying Respirator (PAPR) with HEPA filter is used to provide respiratory protection during autopsy procedures.
- Surgical scrubs, shoe covers, and surgical cap.
    - Remove PPE carefully to avoid contaminating yourself and before leaving the autopsy room or adjacent anteroom.
    - Reusable PPE (e.g., PAPRs) must be cleaned and disinfected according to the manufacturer's recommendations.
    - Immediately after doffing PPE, wash hands with soap and water for 40 seconds or use alcohol-based hand sanitizer if hands are not visibly dirty for 20 seconds. Ensure that hand hygiene facilities are readily available at the point of use (e.g., at or adjacent to the PPE doffing area).

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12. APPENDIX

APPENDIX 1

COVID-19 Investigation Form

Date of initial notification: ____dd/____mm/_____yyyy

Notification			
Name of who completed the form		Contact number	
Date		Email	
Hospital Name		City	
At the time of this report, is the case?	• Confirmed • Suspected • Case under investigation • Not a case		

Patient Information			
Full name		Date of Birth	____dd/____mm/_____yyyy
Nationality			
Identification number:		Marital status	
Occupation	• HCW • Non-HCW_____	Sex	• Male • Female
Phone Number		Age	
Address	House No.:_____ Street name:_____ District ____ City:_____ Province/Region:____		
Education			

Clinical Information

Date of symptoms onset ____/____/_____

Symptoms	Yes	No	Symptoms	Yes	No
Fever ≥38º			Nausea		
History of fever (not measured).			Vomiting		
Loss of smell or taste			Headache		
Sore throat			Muscle pain		
Runny nose			Joint pain		
Cough			Diarrhea		
Shortness of breath			Other (specify):		

Hospitalization Information			
Is/was the patient hospitalized?	• Yes, Date of admission ___/____/_____ • No		
Admitted to ICU?	Intubated?	On ECMO? Extracorporeal membrane oxygenation	Patient died?
• Yes • No	• Yes • No	• Yes • No	• Yes • No

Comorbid conditions (check all that apply):

• None • Unknown • Pregnancy • Diabetes • Hypertension	• Cardiac disease • Chronic pulmonary disease • Chronic kidney disease • Chronic liver disease • Obesity	• Smoking (any type) • Immunocompromised • Other:_____

Epidemiological Information

Visiting and Travel History:

Did the patient travel in the 10 days prior to illness onset?	• Yes • No • Unknown

If yes, Trip 1: Dates of travel: __/__/__ to __/__/__ Country _____ City _____ Trip 2: Dates of travel: __/__/__ to __/__/__ Country _____ City _____ Trip 3: Dates of travel: __/__/__ to __/__/__ Country _____ City _____
In the 10 days prior to illness onset, did the patient have close contact with someone who travelled outside the Country?
• Yes • No • Unknown Please describe individual (including travel location)
If the patient was tourist/pilgrim, please complete information bellow:

Did the patient travel with?	• Airline • Ship • Bus • Car • Other_____

Airline Information:
Airline Name: _____ Flight Number: _____ Origin: _____
Date of arrival: __/__/__ Date of departure: __/__/__ Transit destination: _____
Other Trans Information:
Type of transportation: _____ Date of arrival: ____/____/_____ Port of entry: _____ Origin: _____
Resident Information after arrival:
Name of resident (hotel, Hajj campaign, ..etc.): _____ where: _____ Date of check in: ____/____/_____ Date of check out: ____/____/_____ Note: (Describe the timeline of contact movement)

Contact Exposure	
Did the patient receive vaccination against COVID-19 ? If so which type ?	□ Yes □ No Date: / / Type: ..... Doses: .....
Did the patient have contact with a confirmed COVID-19 case?	• Yes • No • Unknow

Did the patient have contact with anyone during illness period?
• Yes • No • Unknown ***If yes, please complete the list of patient contact in the end of report***
In the 10 days before or after becoming ill, did the patient attend a public event where a large number of people were present (i.e., a sporting event, wedding, concert, Hajj and Umrah)?

• Yes • No • Unknown	*If yes, please describe the event (include date and location)*
In the 10 days before or after becoming ill, did the patient visited any healthcare facility or setting?	
• Yes • No • Unknown	Specify healthcare facility/reason: _____

APPENDIX 2

List of Patient's Contacts

Name of contact	Relation to patient	Last contact date	City	Sex	Phone
		__/__/__		☐ Male ☐ Female	
		__/__/__		☐ Male ☐ Female	
		__/__/__		☐ Male ☐ Female	
		__/__/__		☐ Male ☐ Female	
		__/__/__		☐ Male ☐ Female	
		__/__/__		☐ Male ☐ Female	
		__/__/__		☐ Male ☐ Female	
		__/__/__		☐ Male ☐ Female	
		__/__/__		☐ Male ☐ Female	
		__/__/__		☐ Male ☐ Female	

For follow up of contacts, use the contact tracing form to collect additional information.

APPENDIX 3

Contact Tracing Form (Short Form)

COVID-19

Name of the contact:_____ **ID/ Iqama number:** _____

Age: _____ **Nationality:** _____ **Phone #:**_____

Daily Contact Follow-Up Form		
1 Day after last exposure ____/____/____	**5 Days after last exposure** ____/____/____	**10 Days after last exposure** ____/____/____
☐ No symptoms ☐ Fever____ °C ☐ Shortness of breath ☐ Sore throat ☐ Cough ☐ Headache ☐ Muscle/joint pain ☐ Diarrhea____ times/day ☐ Vomiting/nausea ☐ Runny nose Others_____	☐ No symptoms ☐ Fever____ °C ☐ Shortness of breath ☐ Sore throat ☐ Cough ☐ Headache ☐ Muscle/joint pain ☐ Diarrhea____ times/day ☐ Vomiting/nausea ☐ Runny nose Others_____ Others_____	☐ No symptoms ☐ Fever____ °C ☐ Shortness of breath ☐ Sore throat ☐ Cough ☐ Headache ☐ Muscle/joint pain ☐ Diarrhea____ times/day ☐ Vomiting/nausea ☐ Runny nose Others_____ Others_____

Region: _____ Form completed by: _____

APPENDIX 4

Contact Tracing Form (Daily Form)

COVID-19

Name of the contact: ______________ **ID/ Iqama number:** ______________

Age: ______ **Nationality:** ____________ **Phone #:**_______________

Daily Contact Follow-Up Form

1 Day after last exposure ___/___/___	**2 Days after last exposure** ___/___/___	**3 Days after last exposure** ___/___/___	**4 Days after last exposure** ___/___/___	**5 Days after last xposure** ___/___/___
☐ No symptoms ☐ Fever ____ °C ☐ Shortness of breath ☐ Sore throat ☐ Cough ☐ Headache ☐ Muscle/joint pain ☐ Diarrhea ____ times/day ☐ Vomiting/nausea ☐ Runny nose Others ________	☐ No symptoms ☐ Fever ____ °C ☐ Shortness of breath ☐ Sore throat ☐ Cough ☐ Headache ☐ Muscle/joint pain ☐ Diarrhea ____ times/day ☐ Vomiting/nausea ☐ Runny nose Others ________	☐ No symptoms ☐ Fever ____ °C ☐ Shortness of breath ☐ Sore throat ☐ Cough ☐ Headache ☐ Muscle/joint pain ☐ Diarrhea ____ times/day ☐ Vomiting/nausea ☐ Runny nose Others ________	☐ No symptoms ☐ Fever ____ °C ☐ Shortness of breath ☐ Sore throat ☐ Cough ☐ Headache ☐ Muscle/joint pain ☐ Diarrhea ____ times/day ☐ Vomiting/nausea ☐ Runny nose Others ________	☐ No symptoms ☐ Fever ____ °C ☐ Shortness of breath ☐ Sore throat ☐ Cough ☐ Headache ☐ Muscle/joint pain ☐ Diarrhea ____ times/day ☐ Vomiting/nausea ☐ Runny nose Others ________
6 Days after last exposure ___/___/___	**7 Days after last exposure** ___/___/___	**8 Days after last exposure** ___/___/___	**9 Days after last exposure** ___/___/___	**10 Days after last exposure** ___/___/___
☐ No symptoms ☐ Fever ____ °C ☐ Shortness of breath ☐ Sore throat ☐ Cough ☐ Headache ☐ Muscle/joint pain ☐ Diarrhea ____ times/day ☐ Vomiting/nausea ☐ Runny nose Others ________	☐ No symptoms ☐ Fever ____ °C ☐ Shortness of breath ☐ Sore throat ☐ Cough ☐ Headache ☐ Muscle/joint pain ☐ Diarrhea ____ times/day ☐ Vomiting/nausea ☐ Runny nose Others ________	☐ No symptoms ☐ Fever ____ °C ☐ Shortness of breath ☐ Sore throat ☐ Cough ☐ Headache ☐ Muscle/joint pain ☐ Diarrhea ____ times/day ☐ Vomiting/nausea ☐ Runny nose Others ________	☐ No symptoms ☐ Fever ____ °C ☐ Shortness of breath ☐ Sore throat ☐ Cough ☐ Headache ☐ Muscle/joint pain ☐ Diarrhea ____ times/day ☐ Vomiting/nausea ☐ Runny nose Others ________	☐ No symptoms ☐ Fever ____ °C ☐ Shortness of breath ☐ Sore throat ☐ Cough ☐ Headache ☐ Muscle/joint pain ☐ Diarrhea ____ times/day ☐ Vomiting/nausea ☐ Runny nose Others ________

Region: _________________ Form completed by: _________________

APPENDIX 5

Visual Triage Checklist for MERS and COVID-19

Date:	Time	MRN:
Name:	ID#:	Hospital:

Circle the number reflecting the patient's condition (exposure and clinical picture) and calculate the final score:

Risks for Acute Respiratory Illnesses	**Score**	
A. Exposure Risks	***Any Patient (Adult or Pediatric)***	
A history of travel abroad in the past 10 days. **OR** A contact with a confirmed case of COVID-19 or MERS-CoV in the last 10 days prior to symptom onset. **OR** An exposure to camel or camel's products (direct or indirect*) in the last 10 days prior to symptom onset. **OR** Working in a healthcare facility.	**3**	
B. Clinical Signs and Symptoms	***Pediatric*** (≤14 years)	***Adult*** (>14 years)
1. Fever or recent history of fever.	**4**	**4**
2. Cough (new or worsening).	**4**	**4**
3. Shortness of breath (new or worsening).	**4**	**4**
4. headache, sore throat, or rhinorrhea	**1**	**1**
5. Nausea, vomiting, and/or diarrhea.	**1**	**1**
6. Chronic renal failure, CAD/heart failure, Immunocompromised patient.	**-**	**1**
Total Score		

*Patient or household member

A score ≥ 4, ask the patient to perform hand hygiene, wear a surgical mask, direct the patient through the respiratory pathway, and inform MD for assessment.
MRSE-CoV or COVID-19 testing should only be performed according to case definitions.

Staff name: _____ ID number: _____


وقاية
هيئة الصحة العامة
PUBLIC HEALTH AUTHORITY
وزارة الصحة
Ministry of Health