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Infection Prevention and Control Guidelines for the Coronavirus Disease (COVID-19)

Seventh Edition

Sept 2021

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I. 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 identified in December 2019 in Wuhan city, Hubei province of China, 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 162 other countries. According to the WHO, as of April 28, 2020, there have been more than 3.5 million confirmed cases of COVID worldwide. Most of the cases involved in the first cluster in December 2019 were linked to the large Wuhan Seafood Market. Then the infection spread worldwide and most cases reported from USA and Europe. (The daily status report of confirmed case is available in this link: http://covid19.cdc.gov.sa/).

The original source(s) of SARS-CoV-2 transmission remain unidentified. However, available genetic and epidemiological data suggests 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. However, there is not much information about SARS-CoV-2 to draw definitive conclusions about transmission mode, clinical presentation or the extent to which it has spread. Investigations are currently in progress.

II. Statement of purpose

This document provides guidelines on managing COVID-19 infections based on the best available scientific evidence and broad consensus. Its objective is to:

1. Provide guidance on COVID-19 surveillance activities in the healthcare setting.
2. Enhance the detection of confirmed cases/clusters of COVID-19 infection.
3. Determine clinical and epidemiological characteristics of the COVID-19 infection incubation period, disease, risk factors, secondary attack rates, and modes of transmission.
4. Determine risk (including geographic) factors for infection with the virus.
5. Provide guidance on infection prevention and control practices to be implemented when managing suspected and confirmed COVID-19 cases.
6. Standardize the clinical management of COVID-19 patients.
7. Provide guidance for rational use of resources including laboratory testing.
8. Serve as a focus for quality control, including audit.

Administrative controls:

1. Formation of a high-level committee, the COVID-19 Command and Control Center (COVID-19 CCC) chaired by CEO-HC, that meets daily to oversee the preparedness plans and facilitate actions.
2. Formation of COVID-19 task force that have daily meeting chaired by chief medical officer and involve all stake holders to systematically review needs and assure readiness
3. Formulation of a multifaceted staged organization surge plan with known triggers in space, manpower, equipment and supplies, and organized actions.
4. Establishment of sustainable IPC infrastructures and activities.
5. HCWs training; patients' care givers education.
6. Policies on early recognition of acute respiratory infection potentially due to COVID-19.
7. Access to prompt laboratory testing and reporting of COVID-19 tests.
8. Provision and use of regular supplies.
9. IPC policies and procedures for all facets of healthcare provisions with emphasis on surveillance of acute respiratory infection potentially due to COVID-19.

III. Case Definition and Surveillance Guidance

A. Suspected case

Clinical presentation	Epidemiological link
1. Patient with acute respiratory illness1 (sudden onset of at least one of the following: fever2 (measured or by history), cough, or shortness of breath) AND in the 14 days prior to symptom onset, met at least one of the following epidemiological criteria	Had a history of travel abroad or Has visited or being a resident of high-risk area for COVID-19 in the kingdom3 or A close physical contact4 prior to symptom onset with a confirmed COVID-19 case or Working in healthcare facility
1. Any admitted Adult patient with unexplained sever acute respiratory illness (SARI), either Community Acquired Pneumonia (CAP) or Hospital Acquired Pneumonia (HAP).	Not required

[1] Some patients may present with gastrointestinal symptoms like diarrhea and nausea prior to developing fever and lower respiratory tract signs and symptoms.

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

[3] As determined and announced by the Ministry of Interior and Ministry of Health. High risk area in Kingdom of Saudi Arabia will be updated regularly on the link: (https://covid19.cdc.gov.sa/).
(Riyadh City, Holy City of Makkah, Madinah City, Jeddah City, Al-Hofuf City, AL-Qatif City)

[3] Close Contact" is defined as:

- Health care associated exposure, including providing direct care for COVID-19 patients, working with HCWs infected with COVID-19, visiting patients or staying in the same close environment of a COVID-19 patient.
- Working together in close proximity or sharing the same classroom environment a with COVID-19 patient.
- Traveling together with COVID-19 patient in any kind of transportation.
- Living in the same household as a COVID-19 patient

B. Confirmed case

A person who meets the suspected case definition with laboratory confirmation of COVID-19 infection.

IV. COVID-19 Testing and Re-testing

It is essential to follow collection/sampling instructions using the correct tools for the intended specimen. Perform the collection in the suitable locale for the individual patient. Follow Infection Control guidelines and recommended PPE for the health care worker performing the sampling

1. Indications for COVID-19 Testing

1.1. Patients meeting the case definition.

1.2. Patients for elective admission or high-risk procedure (e.g., endoscopy, interventional radiology):

1.2.1. Book the patient 24-48 hours earlier in "External Testing Center New Follow up".

1.2.2. If positive: to inform the patient by phone, instruct the patient to call 937, and report results as usual

1.2.3. If negative, to proceed with elective admission/procedure.

1.3. Emergency admission from EMS, to be tested in EMS, admitting team to proceed with care and transfer as indicated. Patient should be dealt with as COVID in terms of precautions and PPE.

1.4. Urgent admission from clinics, infusion bays, and Day Units: to be tested in their admission floors using ICHE Guidelines. The admitting team will proceed with care and transfer as indicated. Patient should be dealt with as COVID in terms of precautions and PPE. If positive, to be transferred to COVID floor.

1.5. Patients transferred from other hospitals for urgent care, to be tested at the referring hospital. If not available, the patient can be routed to EMS for assessment and testing, then proceed to the floor. The admitting team will proceed with care as indicated. Patient should be dealt with as COVID in terms of precautions and PPE. If positive, to be transferred to COVID floor.

1.6. Health Care workers exposed to COVID-19 case.

1.6.1. High-risk (unprotected exposure) or did not complete Vaccine: final testing after 5 days from last exposure.

1.6.2. Low-risk unprotected exposure) or did not complete Vaccine: testing after 24 hours from last day of exposure.

1.6.3. Protected exposure or Vaccine complete status: no testing.

1.6.4. Completed vaccine staff who are exposed to confirmed cases will always be considered as No risk

1.6.5. Completion of vaccine means:

1.6.5.1.1.1. Who has spent two weeks after receiving the second dose of an approved two-dose vaccine (Pfizer or AstraZeneca)

1.6.5.1.1.2. Those who spend two weeks after receiving the first dose of an approved two-dose vaccine and have a laboratory-confirmed previous infection, regardless of when it occurred

2. Repeat Testing

2.1. The validity of a negative COVID-19 is 7 days with no need for repeat unless indicated otherwise by ICHE.

2.2. A negative test may be repeated after 7 days for screening indications

2.3. A negative test may be repeated before 7 days if medically indicated for a suspected case. A call to the Head, Section of Microbiology is required to overcome the test lucking period of 7 days in ICIS.

2.4. If original test is negative

2.4.1. Symptomatic or develop suggestive symptoms, and respiratory multiplex is negative as clinically indicated.

2.4.2. After high risk exposure, at day 5 after exposure.

2.4.3. Prior to discharge: 24h after the first negative test.

2.5. If original test is positive.

2.5.1. A positive test should not be repeated. There is no clinical or public health rationale for repeating a positive PCR test.

3. Discharging COVID Patients from Hospital

3.1. Discharging a COVID patient should be based on medical judgment and need for inpatient care provided that the following are met:

3.1.1. Resolution of symptoms of fever (without antipyretics), and oxygen requirements for at least 48h

3.1.2. At least 10 days have elapsed since the positive COVID PCR

3.1.3. Home isolation for 14 days and access to care are ensured

3.1.4. For patient flow purposes and isolation protocols, patients remain as "COVID" during the 14-day home isolation

3.2. Declaring confirmed patients as "recovered" is based on:

3.2.1. Symptomatic patients: resolution for symptoms for 48h, and 10 days after test confirmation

3.2.2. Asymptomatic persons: Seven days after test confirmation

3.2.3. Home isolation for 14 days and access to care are ensured

3.2.4. For patient flow purposes and isolation protocols, patients remain as "COVID" during the 14-day home isolation

4. Admit COVID Patients only if Medically Indicated

4.1 Clinical or radiological evidence of pneumonia

4.2 Age > 65 years

4.3 Low oxygen saturation SpO2 < 94% on room air

4.4 History of organ dysfunction (heart, lung, kidney, liver)

4.5 Diabetes Mellitus, Obesity, or hypertension

4.6 Transplant, cancer, or immune-suppressed patients

4.7 Patients who do not require admission:

4.7.1 Need to be educated about the isolation requirements, disease symptoms, when and how to access care

4.7.2 Home isolation for 14 days and access to care are ensured

4.7.3 For patient flow purposes and isolation protocols, patients remain as "COVID" during the 14-day home isolation

4.7.4 Are contacted by the COVID nurse clinic daily to go over:

4.7.4.1 General condition and new symptoms

4.7.4.2 Answer questions and educate on the disease

4.7.4.3 Arrange access to further care if needed in ER or Family Medicine as appropriate

5. Using Hydroxychloroquine for Ambulatory Patients (from ER or Clinics)

5.1. Patients with no symptoms: No treatment

5.2. Patients with mild symptoms of fever, sore throat, anosmia, gastrointestinal symptoms, or headache, and have no risk for severe disease or complications: No treatment

5.3. Patients with moderate symptoms of fever, sore throat, anosmia, gastrointestinal symptoms, or headache, and have no risk for severe disease or complications: to be considered for hydroxychloroquine as 400 mg bid for day 1, then 200 mg bid for days 2-5

V. Infection Prevention and Control Precautions

1. General guide

1.1. COVID-19 definition poster shall be displayed in all screening areas.

1.2. Posters are available from the department of ICHE.

1.3. All HCW shall comply with standard precautions. Refer to standard and Transmission Based Precautions Policy http://rnavex.internal.kfshrc.edu.sa/dotNet/documents/?docid=5196).

1.4. No special requirements for the handling of linen, dishes or cutlery.

1.5. Alcohol-based hand rub (ABHR) dispensers shall be available in public areas and all HCWs shall adhere to the WHO- 5 Moments for Hand Hygiene. Refer to CIPP-640 http://rnavex.internal.kfshrc.edu.sa/dotNet/documents/?docid=650).

1.6. Any persons entering KFSH&RC facilities, including patients, visitors, and staff who are experiencing Flu-like illness or respiratory symptoms cover their mouth and nose using tissues, and cleanse their hands with soap and water or ABHR. Refer to CIPP http://rnavex.internal.kfshrc.edu.sa/dotNet/documents/?docid=693.

1.7. All equipment/supplies shall be identified and stored in a manner that prevents contamination.

1.8. Reusable non-critical equipment (e.g. blood pressure cuffs, stethoscopes, pulse oximeters, bedpans, walkers) along with re-useable toys, electronic games, personal effects shall be dedicated to the use of the patient, and cleaned/disinfected before reuse on another patient (refer to CIPP-724& General Infection Prevention and Control Policy).

1.9. Single use devices shall be discarded in a hands-free receptacle after use.

1.10. Any equipment that requires disinfection and/or sterilization shall be placed in a designated container with a lid and placed in the disposal room as appropriate.

1.11. Disposable cleaning cloths and EPA approved hospital disinfectant shall be stored inside the isolation room for use by nursing/support staff.

1.12. Prevention of overcrowding especially in the emergency department.

1.13. 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.

1.14. Physical separation of at least 1.2-meter distance should be maintained between each suspect patient and others.

2. Standard precautions

Standard Precautions shall be used for all patients and include:

2.1 Hand Hygiene (refer to CIPP-640).

2.1.1 ALL HCW shall follow WHO 5 moments for hand hygiene

2.1.2 If hands are visibly soiled or after contact with body fluids perform hand washing for 40 to 60 Seconds

2.1.3 If hands are visibly clean use alcohol-based hand rub as per 5 moments for 20-30 seconds

2.2 PPE

2.2.1 PPE shall be used for potential exposure to blood and body fluids for all patient.

2.2.2 For PPE indications for use see Appendix 2

2.2.3 For donning and doffing of PPE see Appendix 3

2.2.4 Gloves shall not replace hand hygiene

2.2.5 During patient care gloves shall be changed when moving from contaminated body site to clean body site

2.2.6 Gloves shall be removed directly after completing patient care

2.2.7 Isolation gowns are single use and shall not be reused

2.2.8 Surgical masks are single use and shall not be reused

2.2.9 Remove surgical masks before leaving patient's room

2.2.10 For patients with suspected/confirmed COVID-19 N95 masks shall be single use (refer to CIPP-5110).

2.3 Linen Management

2.3.1 Clean linen shall be stored in a clean covered area.

2.3.2 Linen soiled with blood, body fluids, secretions and excretions must be handled, transported and processed, in a manner that prevents skin and mucous membrane exposure, contamination of clothing; and avoids transfer of microorganisms to other patients and environment

2.4 Equipment Cleaning (refer to CIPP-5109)

2.4.1 Patient care equipment shall be decontaminated using EPA approved disinfectant before being used on other patients and before being sent for maintenance or repair.

2.4.2 Reusable instruments/devices that are or may be contaminated with blood or body fluids shall have gross blood/fluids rinsed or wiped off before placement in a rigid, puncture-proof container for return to CSSD.

2.4.3 PPE shall be worn based on the degree of potential contamination when handling patient care equipment and instruments/devices that are visibly soiled Single use items shall not be re-used and shall be disposed of in the appropriate waste Single use items shall not be re-used and shall be disposed of in the appropriate waste

2.5 Manage laundry, food service utensils and medical waste in accordance with safe routine procedures and prevention of needle-stick or sharps injury

3. Respiratory hygiene

3.1 Respiratory hygiene and cough etiquette posters shall be displayed in prominent locations in the DEM, inpatient and outpatient areas (e.g. clinics, Family Medicine, Dialysis Unit).

3.2 Posters are available from the department of ICHE

3.3 Patients and visitors experiencing respiratory symptoms shall be educated that they shall inform a HCW regarding flu-like symptoms immediately upon arrival to their appointments/appointed areas.

3.4 Patients and/or visitors with respiratory symptoms shall be instructed on cough etiquette and provided with supplies as needed.

3.5 Supplies of tissues, surgical masks, ABHR and hands-free waste receptacles shall be available in public areas as required.

3.6 Nursing staff shall ensure that symptomatic patients are isolated and evaluated as promptly as feasible.

4. Triage for rapid identification of patients with acute respiratory illness (SARI)

4.1 Visual triage should be used for early identification of all patients with ARI in the Emergency Room, dialysis unit, and the Clinics.

4.2 Rapid identification of patients with SARI and patients suspected of COVID-19 infection is key to prevent healthcare-associated transmission of COVID-19 or other respiratory viruses. Appropriate

infection control precautions and respiratory etiquette (described above) or source control should be promptly applied.

4.3 Visual triage station should be placed at the entry point of the healthcare facility (i.e. Emergency room entrance, dialysis unit entrance) or other designated areas and attended by a nurse or nurse assistant who is trained on suspicion of COVID-19 as per a checklist form with scoring Appendix 1.

4.4 Identified SARI patients should be asked to wear a surgical mask. They should be evaluated immediately in an area separate from other patients

4.5 Infection control and prevention precautions should be promptly implemented

4.6 If SARI patients cannot be evaluated immediately, they should wait in a waiting area dedicated for the SARI patients with spatial separation of at least 1.2 m between each ARI patient and others.

4.7 Clinical and epidemiological aspects of the cases should be evaluated as soon as possible, and the investigation should be complemented by laboratory evaluation.

5 Transmission-based Precautions

5.1 Contact and Droplet precautions for suspected COVID-19:

5.1.1 All HCWs shall follow appropriate transmission-based precautions.

5.1.2 All suspected/confirmed COVID-19 patients shall be placed in Droplet and Contact transmission-based precautions, in addition to standard routine precautions.

5.1.3 Appropriate signage shall be visible on the door.

5.1.4 AIIR door shall be kept closed at all times while the patient is on transmission-based precautions.

5.1.5 Place patients in neutral single rooms with one portable HEPA filter.

5.1.6 When single rooms are not available, cohort patients suspected of COVID-19 infection together (Place patient beds at least 1.2 m apart, when possible, cohort HCWs to exclusively care for COVID-19 cases)

5.1.7 Use a surgical mask with an eye/facial protection (i.e. goggles or a face shield).

5.1.8 Use gloves and a clean, non-sterile, long-sleeved gown.

5.1.9 Donning your PPE, adhere to sequence of donning PPE as per the Appendix 3.

5.1.10 Doffing your PPE after caring for a patient in a proper way then dispose it at the exit point, adhere to sequence of doffing PPE as per the Appendix 3.

5.1.11 after doffing, hand hygiene must be performed.

5.1.12 All HCW shall remove the surgical mask before leaving the room.

5.1.13 All HCW shall remove gloves, gown and surgical mask inside the patient's room at exit point.

5.1.14 Hand hygiene shall be performed as per WHO 5 moments for hand hygiene.

5.1.15 Use dedicated equipment for each patient (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%).

5.1.16 Do not touch your eyes, nose or mouth with potentially contaminated hands.

5.1.17 Avoid the movement and transport of patients out of the room or area unless medically necessary.

5.1.18 Use designated portable X-ray equipment and/or other important diagnostic equipment.

5.2 Airborne precautions for aerosol-generating procedures for suspected COVID-19

The following are the list if Aerosol Generating Procedures (AGP) that is meant to trigger the use of an N95 respiratory (or PAPR) by Healthcare Workers (HCP). These procedures include but not limited to:

5.2.1 Intubation, extubation, and related procedures such as manual ventilation and open suctioning.

5.2.2 Tracheotomy/tracheostomy procedures (insertion/open suctioning/removal)

5.2.3 Bronchoscopy

5.2.4 Surgery and post-mortem procedures involving high-speed devices Some dental procedures (such as high-speed drilling)

5.2.5 Non-invasive ventilation (NIV) such as bi-level positive airway pressure (BIPAP)

5.2.6 Continuous positive airway pressure ventilation (CPAP)

5.2.7 High-frequency oscillating ventilation (HFOV) High-flow nasal oxygen (HFNO), also called high-flow nasal cannula

5.2.8 Induction of sputum Medication

5.2.9 Administration via continuous nebulizer

5.2.10 Whenever cardiopulmonary resuscitation (CPR) is performed

5.2.11 Any time ventilator circuits are broken

5.2.12 During the use of secretion clearing devices

5.2.13 During the collection of nasopharyngeal swabs and/or aspirates

5.2.14 HCWs performing aerosol-generating procedures should note the following:

5.2.14.1 AGPs shall be performed in an AIIR with at least 12 air changes per hour (ACH) and controlled direction of air flow when using mechanical ventilation.

5.2.14.2 Limit the number of persons present in the room to the absolute minimum required for the patient's care and support.

5.2.14.3 If not available, use neutral room and two portable HEPA filter in ICUs only.

5.2.14.4 For sample collection neutral room and one portable HEPA filter.

5.2.14.5 All HCW shall be fit tested for a high particulate respirator N95.

5.2.14.6 Always perform the seal-check when putting on a disposable particulate respirator (certified N95).

5.2.14.7 It is the HCWs responsibility to know which N95 mask they are fit tested for.

5.2.14.8 All PPEs shall be removed inside the anti-chamber/isolation room at the exit point except for the N95 mask.

5.2.14.9 N95 mask shall be removed outside the room after hand hygiene has been performed.

5.2.14.10 HCWs shall wear a fit-tested N95 mask for suspected/confirmed COVID-19 patients shall discard the mask after every single use.

5.2.14.11 HCW that all available types of (N95) are not fit to him should be avoided from aerosol-generating procedures or use PAPR (Powered Air-Purifying Respirator).

5.2.14.12 Facial hair (beard) prevents proper respirator fit; either avoid aerosol-generating procedures or use PAPR.

5.2.14.13 Use eye protection (i.e. goggles or a face shield).

5.2.14.14 Clean, non-sterile, long-sleeved 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.

6 Protective Equipment (PPE) Requirements for COVID-19 Confirmed Cases Based on Type of Activity

6.1 Aerosol Generating Procedure (AGP)

The following are the list if Aerosol Generating Procedures (AGP) that is meant to trigger the use of an N95 respiratory (or PAPR) by Healthcare Workers (HCP). These procedures include but not limited to:

6.1.1 Intubation, extubation, and related procedures such as manual ventilation and open suctioning.
6.1.2 Tracheotomy/tracheostomy procedures (insertion/open suctioning/removal)
6.1.3 Bronchoscopy
6.1.4 Surgery and post-mortem procedures involving high-speed devices.
6.1.5 Some dental procedures (such as high-speed drilling)
6.1.6 Non-invasive ventilation (NIV) such as bi-level positive airway pressure (BIPAP)
6.1.7 Continuous positive airway pressure ventilation (CPAP)
6.1.8 High-frequency oscillating ventilation (HFOV).
6.1.9 High-flow nasal oxygen (HFNO), also called high-flow nasal cannula
6.1.10 Induction of sputum Medication
6.1.11 Administration via continuous nebulizer
6.1.12 Whenever cardiopulmonary resuscitation (CPR) is performed
6.1.13 Any time ventilator circuits are broken
6.1.14 During the use of secretion clearing devices
6.1.15 During the collection of nasopharyngeal swabs and/or aspirates

6.2 Required PPE for Aerosol Generating Procedure (AGP)

6.2.1 Hand Hygiene
6.2.2 Negative pressure room, if not available use neutral room with two (2) Portable HEPA-filters placed at the level or the head of the patient one on each side
6.2.3 Fit tested N95 respirator
6.2.4 Surgical gown
6.2.5 Sterile Gloves
6.2.6 Eye protection (Face shield or goggles)
6.2.7 Apron
6.2.8 PAPR (Powered Air Purifying Respiratory) for a person not fit tested or have facial hair
6.2.9 Head cover/Disposable Hood/Hijab
6.2.10 Shoe cover
6.2.11 Old MCO COVID-19 and 2D External Testing Center. These areas need to adopt the reuse and extended use of N95 respiratory approaches

6.3 Required PPE for Usual Care of intubated patient that did not cause in Aerosol generation

6.3.1 Hand Hygiene
6.3.2 Surgical mask
6.3.3 Long sleeve yellow gown
6.3.4 Gloves
6.3.5 Eye protection (Goggles or face shield)

6.4 Required PPE for Transport of patient to health care facility by Ambulance or within the facility

6.4.1 Hand Hygiene
6.4.2 Patient to put on a surgical mask

6.4.3 Surgical mask
6.4.4 Long sleeves yellow gown
6.4.5 Gloves
6.4.6 Eye protection (Goggles or face shield)

6.5 Required PPE for Surgical procedure

3.1.1 Hand Hygiene
3.1.2 Postpone non-urgent surgeries for COVID-19 patient and schedule COVID-19 cases at the end of the list, if surgery is deemed necessary
3.1.3 Keep the surgical team to a minimum number
3.1.4 PPE during OR:
3.3.4.1. Medical protective Sterile surgical gown
3.3.4.2. Double head cap
3.3.4.3. Shoe cover
3.3.4.4. Fit tested N95 mask
3.3.4.5. Eye protection (Googles or face shield)
3.3.4.6. Sterile surgical gloves
3.3.4.7. PAPR, if not fit test or have facial hair
3.3.5. Minimize the surgical team members as much as possible without compromising the care delivery

6.6 Required PPE for Cleaning the room (Housekeeping)

6.6.1 Hand Hygiene
6.6.2 Surgical Mask.
6.6.3 Long sleeve yellow gown.
6.6.4 Heavy-duty gloves
6.6.5 Eye protection (Goggles or face shield)
6.6.6 Shoe cover

6.7 Required PPE for Laboratory (Manipulator of the respiratory sample)

6.7.1 Hand Hygiene
6.7.2 Surgical mask.
6.7.3 Long sleeve yellow gown.
6.7.4 Gloves
6.7.5 Eye protection (if risk of splash)
6.7.6 Handle sample under safety cabinet

6.8 Required PPE for Patient Triaging

6.8.1 Hand Hygiene
6.8.2 Surgical Mask
6.8.3 Long sleeve yellow gown.
6.8.4 Gloves

6.9 Required PPE for Providing Direct Care

6.9.1 Hand Hygiene
6.9.2 Surgical Mask
6.9.3 Long sleeve yellow gown
6.9.4 Gloves
6.9.5 Eye Protection (Goggles or face shield)

6.10 Required PPE for All hospital premises

6.10.1 Hand Hygiene
6.10.2 Cough Etiquette & Respiratory hygiene
6.10.3 Follow interim guidance of COVID-19 Command & Control Centre
6.10.4 Universal use of a surgical mask

7 Personal Protective Equipment (PPE) for Healthcare Workers (HCWs)

7.1 Perform hand hygiene
7.2 Keep hands away from face
7.3 Limit surfaces touched
7.4 Change gloves when torn heavily contaminated
7.5 The following PPE should be worn by HCWs upon entry into suspected /confirmed COVID-19 patient rooms or care areas in respected order.
7.6 For patients under airborne precautions, all persons entering the patient's room should wear a fit-tested, seal checked N-95 mask instead of a surgical mask. For those who failed the fit testing of N95 masks (e.g. those with beards), an alternative respirator, such as a powered air-purifying respirator (PAPR), should be used.
7.7 Upon exit from the patient room or care area, PPE should be removed and discarded.
7.8 Except for N95 masks, remove PPE at the doorway or in the anteroom. Remove N95 mask after leaving the patient room and closing the door.
7.9 For female staff who wear veils, the N95 mask should always be placed directly on the face behind the veil and not over the veil. In this instance, a face-shield should also be used along with the mask to protect the veil from droplet sprays.
7.10 Perform hand hygiene before and after contact with the patient or his/her surroundings and immediately after removal of PPE.
7.11 HCWs shall not touch their eyes, nose or mouth with potentially contaminated gloved or ungloved hands.

7.12 Sequence on Putting Personal Protective Equipment (PPE)-Donning

The type of PPE used will vary based in the level of precautions required, such as standard, contact droplet, or airborne. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

7.12.1 Perform Hand Hygiene
7.12.2 Don protective shoe cover <u>(for AGP only)</u>
7.12.3 Perform Hand Hygiene
7.12.4 Gown
7.12.4.1 Fully cover torso from neck and knees, arms to end of wrists, and wrap around the back
7.12.4.2 Fasten in back of neck and waist
7.12.5 Mask or Respirator
7.12.5.1 Secure ties or elastic bands at middle of head and neck
7.12.5.2 Fit flexible band to nose bridge
7.12.5.3 Fit snug to face and below chin
7.12.5.4 Fit-check respirator
7.12.6 Don Head cover (for AGP only)
7.12.6.1 HCWs shall cover all hair and ears.
7.12.7 Goggles or Face Shield
7.12.7.1 Place over face and eyes and adjust to fit
7.12.8 Gloves
7.12.8.1 Pull the gloves to cover the wrist of the isolation gown

7.13 How to Safely Remove Personal Protective Equipment (PPE)-Doffing

There are a variety of ways to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials

Note:

1. Remove all PPE before existing the patient room except a respirator, if worn.
2. Remove the respiratory after leaving the patient room and closing the door.
3. If hands become visibly contaminated during PPE removal, wash hands before continuing to remove the remaining PPE

7.13.1 Remove PPE in The Following Sequence

<u>Example 1:</u>

2. Gloves
   1.1 Outside of gloves are contaminated
   1.2 Using a gloved hand, grasp the palm area of the other gloved hand and peel off first glove
   1.3 Hold removed glove in gloved hand
   1.4 Slide fingers of ungloved hand under remaining glove at wrist and peel off second glove over first glove
   1.5 Discard into waste container
   1.6 If your hands get contaminated during glove removal, immediately wash your hands or use an alcohol-based hand sanitizer

2 Perform Hand Hygiene

3 Remove Goggles or Face Shield
   3.1 Outside of goggles or face shield are contaminated!
   3.2 If your hands get contaminated during goggle or face shield removal, immediately wash your hands, or use an alcohol-based hand sanitizer
   3.3 Remove goggles or face shield from the back by lifting head band or earpieces
   3.4 If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container

4 Removing Isolation Gown
   4.1 Gown front and sleeves are contaminated
   4.2 If your hands get contaminated during gown removal, immediately wash your hands or use an alcohol-based hand sanitizer
   4.3 Unfasten gown ties, taking care that sleeves don't contact your body when reaching for ties
   4.4 Pull gown away from neck and shoulders, touching inside of gown only
   4.5 Turn gown inside out
   4.6 Fold or roll into a bundle and discard in a waste container

5 Removing Mask or Respirator
   5.1 Front of mask/respirator is contaminated — Do Not Touch!
   5.2 If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
   5.3 Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
   5.4 Discard in a waste container

Note:
1. Immediately after removing all PPE wash hands or use an alcohol–based hand sanitizer
2. Perform hand hygiene between steps if hands become contaminated and immediately after removing all PPE

Example 2: Recommended for AGP

1. Gown and Gloves
   1.1 Gown front and sleeves and the outside of gloves are contaminated!
   1.2 If your hands get contaminated during gown or glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
   1.3 Grasp the gown in the front and pull away from your body so that the ties break, touching outside of gown only with gloved hands
   1.4 While removing the gown, fold or roll the gown inside-out into a bundle
   1.5 As you are removing the gown, peel off your gloves at the same time, only touching the inside of the gloves and gown with your bare hands. Place the gown and gloves into a waste container
2. Perform Hand Hygiene
3. Goggles or Face Shield
   3.1 Outside of goggles or face shield are contaminated!
   3.2 If your hands get contaminated during goggle or face shield removal, immediately wash your hands, or use an alcohol-based hand sanitizer

3.3 Remove goggles or face shield from the back by lifting head band and without touching the front of the goggles or face shield
3.4 If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container

4. Head cover (for AGP only)
   4.1 Tilt head slightly forward and pull the cover off.
   4.2 Lift away from face and head
   4.3 discard in a waste container
5. Shoe cover (for AGP only)
   5.1 Grasp outside edge near shoe
   5.2 Peel away from shoe turning shoe cover inside-out
   5.3 Discard into waste container
6. Perform Hand Hygiene
7. Mask or Respirator
   7.1 Front of mask/respirator is contaminated — Do Not Touch!
   7.2 If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
   7.3 Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
   7.4 Discard in a waste container
8. Perform Hand Hygiene

Note: Wash hands or use an alcohol-based hand sanitizer immediately after removing all PPE

8 Transportation of Suspected and Confirmed Covid-19 Patients

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 units. 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:

8.1 Precautions during Patient assessment
8.2 Where possible, ambulance staff should carry out initial assessment keeping a distance of at least 1.8m from the patient.
8.3 For additional staff protection, the number of ambulance staff in the patient section of the ambulance should be restricted to the minimum required.
8.4 It is best to limit contact with patient contact until a 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.
8.5 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.
8.6 Family members and other contacts of patients should not ride in the ambulance if possible. If necessary, they should be asked to wear appropriate PPE
8.7 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.
8.8 Additional recommendations for aerosol-generating procedures.
8.9 Recommendations on Personal Protective Equipment (PPE)
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 (PPE: Surgical mask, Gloves, Long sleeved Gown and Eye protection face shield or google)

8.9.1 The driver that 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.

8.9.2 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.

8.9.3 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.

8.9.4 driver, he should remove his face shield or goggles, gown and gloves and perform hand hygiene.

8.9.5 Ambulance staff should avoid touching their faces while working.

8.9.6 Upon arrival at the health care facility and following patient hand over ambulance staff should doff and discard PPE and perform hand hygiene.

8.9.7 They should discard used PPE following the sequence of donning and doffing and perform hand hygiene.

8.10 Recommendations for Ambulance Staff During Transportation

The following recommendations apply to ambulance staff involved in the transport or transfer of a patient with an exposure history and signs and symptoms suggestive of COVID-19 infection to a healthcare facility for advanced management while transporting the patient:

8.10.1 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.

8.10.2 To the extent possible, staff should ensure patients are isolated from non-patients. This includes not allowing family members and other contacts to accompany suspected and confirmed COVID-19 infected patients in the ambulance. If they accompany the patient, they must wear a facemask

8.10.3 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.

8.10.4 During the transportation, 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.

8.10.5 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.

8.10.6 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.

8.10.7 The ambulance staff should complete the handing over process at the destination health care facility following standard procedures.

8.11 Patients care Documentation

8.11.1 Only after the ambulance staff have completed patient hand over, PPE doffing and hand hygiene should they proceed to patient care documentation.

8.11.2 The documentation should include a listing of all the HCWs that provided care for the patient (direct or indirect) and the level of contact.

8.12 Cleaning and Disinfect Ambulances after Transporting a Patient with Suspected or Confirmed COVID-19

8.12.1 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.

8.12.2 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.

8.12.3 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.

8.12.4 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.

8.12.5 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.

8.12.6 Clean and disinfect reusable patient-care equipment before use on another patient, according to manufacturer's instructions.

8.12.7 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

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

8.13.1 Ambulance staff should carry out follow-up/reporting measures required of them post care of a patient with suspected or confirmed COVID-19 infection. Their supervisors should implement regulations requiring monitoring, excluding from work, etc. as pertains to HCWs having potential exposure to COVID-19 infected patients.

8.13.2 Ambulance staff are required to promptly inform their supervisor of exposures to a patient with suspected or confirmed COVID-19 infection who can ensure that appropriate action is taken.

8.13.3 Ambulance staff are required to report any unprotected exposure to patient with suspected or confirmed COVID-19 infection (e.g. not donning recommended PPE, compromised or inappropriate PPE, etc.) to their supervisor or infection control for appropriate evaluation and action.

8.13.4 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.

8.14 Patient transportation inside the hospital

8.14.1 Limit movement/transport of the patient from the room, to essential purposes only as much as medically feasible.

8.14.2 If the patient is transported outside the room, ensure precautions are maintained and the isolation sign shall be transported with the patient to minimize the risk of transmission of pathogens to other patients, visitors and contamination of environmental surfaces and equipment.

8.14.3 If transport is necessary, the patient shall be transported in clean clothes (e.g. hospital pajamas) on clean sheets in wheelchair or stretcher with any open skin sites securely covered.

8.14.4 The patient shall not wear a yellow isolation gown

8.14.5 The patient chart shall be placed in a plastic holder/plastic or paper bag and placed on the shelf underneath the bed/trolley to prevent contamination.

8.14.6 No further precautions required for patients on contact transmission-based precautions.

8.14.7 Patients on droplet or airborne transmission-based precautions shall wear a surgical mask for suspected or confirmed infectious COVID-19 during transport and waiting areas.

8.14.8 Patients with tracheostomy: place a mask over the tracheostomy site/opening if possible.

8.14.9 N95 masks have a one-way filter system and shall Not be worn by the patient; exception, patients in PE room that are required to leave the room during periods of construction

8.14.10 Practice respiratory hygiene/cough etiquette.

8.14.11 COVID-19patients who are unable to wear a surgical mask or cooperate shall be transported in an iso-pod.

8.14.12 For coordination of transfer via iso-pod contact paramedic services.

8.14.13 The patient shall clean hands with alcohol hand gel or with antibacterial soap and water before leaving the room

8.14.14 Patients requiring transport on their own bed, with multiple pieces of equipment shall be accompanied by staff wearing gowns and gloves; and if possible, one person without PPE should be designated for contact with environmental surfaces, e.g. opening doors or pushing elevator button/s.

8.14.15 HCW shall wear surgical masks, gloves, long sleeved gown and eye protection face shield or googles during transportation of patients.
8.14.16 After transport, the stretcher or wheelchair must be cleaned with hospital approved disinfectant before use on another patient.
8.14.17 Staff in receiving departments shall wear appropriate PPE for contact and droplet precautions upon receiving the patient.

9 Cleaning and disinfection of occupied COVID-19 patient rooms

9.1 Consider designating specific, well-trained housekeeping personnel for cleaning and disinfecting of COVID-19 patient rooms/units.
9.2 Staff nurse shall clean and disinfect the surfaces of patient-care equipment (e.g.,IV pumps, ventilators, monitors., etc.).
9.3 Document the disinfection in a checklist
9.4 Housekeeping personnel should wear appropriate PPE. These staff should be trained by the infection control team in proper procedures for PPE use, including removal of PPE, and the importance of hand hygiene.
9.5 Keep cleaning supplies outside the patient room (e.g., in an anteroom or storage area).
9.6 Keep areas around the patient free of unnecessary supplies and equipment to facilitate daily cleaning.
9.7 Use Hospital approved disinfectants as the manufacturer's recommendation (i.e., concentration), contact time, and care in handling.
9.8 Clean and disinfect COVID-19 patients' rooms at least daily and more often when visible soiling/contamination occurs. Frequently disinfect high touched surfaces (e.g., bedrails, bedside and over-bed tables, TV control, call button, telephone, lavatory surfaces including safety/pull-up bars, doorknobs, commodes, ventilator and monitor surfaces) in addition to floors and other horizontal surfaces.
9.9 Wipe external surfaces of portable equipment for performing x-rays and other procedures in the patient's room with a hospital -approved disinfectant upon removal from the patient's room.
9.10 After an aerosol-generating procedure (e.g., intubation), clean and disinfect horizontal surfaces around the patient. Clean and disinfect as soon as possible after the procedure.
9.11 Clean and disinfect spills of blood and body fluids by current recommendations for spill management refer to medical disposable waste policy.
9.12 Cleaning and disinfection after COVID-19 patient discharge or transfer
9.13 Follow standard procedures for terminal cleaning of an isolation room.
9.14 Clean and disinfect all surfaces that were in contact with the patient or may have become contaminated during patient care.
9.15 Wipe down mattresses and headboards with a hospital-approved disinfectant.
9.16 Privacy curtains should be removed, placed in a bag in the room and then transported to be laundered.
9.17 No special treatment is necessary for window curtains, ceilings, and walls unless there is evidence of visible soil.

10 Environmental Cleaning and Disinfection After Suspected/Confirmed COVID-19 Case

10.1 Terminal room cleaning at the time of discharge or transfer of patients.
10.2 In-patient rooms housing COVID-19 patients should be cleaned and disinfected at least daily and at the time of patient transfer or discharge
10.3 More frequent cleaning and disinfection may be indicated for high-touch surfaces and following aerosol producing procedures (e.g. tables, hardbacked chairs, doorknobs, light switches, remotes, handles, desks, toilets, sinks)
10.4 Cleaning staff shall wear disposable gloves, surgical mask, eye protection face shield or googles, shoe cover and long-sleeved gowns for all tasks in the cleaning process, including handling of waste.
10.5 Cleaning and disinfection of the environmental surfaces should be with approved hospital disinfectant (bleach)
10.6 After patient transfer, terminal cleaning should be done using manual method and followed hydrogen peroxide vapor.
10.7 The Environmental Services Staff shall use the Hydrogen Peroxide Vapor technology after the discharge

10.8 of patients with an infection control alert from side rooms or following theatre procedures.
10.9 The ICHE team shall provide guidance as to when it is appropriate to use the Hydrogen Peroxide Vapor.
10.10 The Hydrogen Peroxide Vapor shall be used after discharge of all confirmed COVID-19.
10.11 The patient room that need Hydrogen Peroxide Vapor shall be identified and approve by ICHE.
10.12 notification shall be sent by ICHE to Nursing Affairs, Case Management, Admission and Environmental Services on a regular basis
10.13 Procedure rooms (Radiology /Operating Room theater) shall be close as per the Housekeeper and infection control guide at the end of the day shift to be disinfect by Bleach followed by Hydrogen Peroxide Vapor for 2 hrs.
10.14 If designated COVID-19 procedure room scheduled for more than one positive case routine cleaning and disinfection by bleach (30 min) shall be completed prior the following positive case

11 Medical waste

11.1 Contain and dispose of COVID-19-contaminated medical waste in biohazard waste container.
11.2 Wear disposable gloves when handling waste.
11.3 Perform hand hygiene after removal of gloves.

12 Linen and laundry

12.1 Store clean linen outside patient rooms, taking into the room only linen needed for use during the shift.
12.2 Place soiled linen directly into a laundry bag in the patient's room. Contain linen in a manner that prevents the linen bag from opening or bursting during transport and while in the soiled linen holding area
12.3 Wear gloves and gown when directly handling soiled linen and laundry (e.g., bedding, towels, personal clothing). Do not shake or otherwise handle soiled linen and laundry in a manner that might aerosolize infectious particles.

13 Patient placement at Emergency Room (EMS)

13.1 All patients with a EMS visit shall be screened for SARI at the screening desk before triage and waiting area.
13.2 HCWs performing the SARI screening shall wear a surgical mask.
13.3 Adult/pediatric SARI screening shall be completed in ICIS via ad-hoc charting.
13.4 Prompt identification and isolation of patients shall occur at the screening desk.
13.5 Escalation procedures for an influx of potential COVID-19 patients shall be adhered to (refer to epidemic plan).
13.6 Patients with a SARI score of four (4) or above OR who meet the suspected case definition shall be sent to the Respiratory designated area for prompt medical review.
13.7 The attending physician shall be informed of the patient's symptoms and the SARI score for medical evaluation.
13.8 The attending physician shall order a COVID-19 test if the patient meets the suspected case for the patient.
13.9 The COVID-19 screen shall be collected in an AIIR, if not available neutral room with portable HEPA filter with the HCW wearing appropriate PPE.
13.10 DEM shall inform ICHE of all suspected cases.
13.11 If the patient's condition does not permit the transfer to the respiratory designated area, the patient shall be placed in an AIIR room in the main DEM. if not available neutral room with portable HEPA filter.
13.12 Patients for admission with confirmed COVID-19 shall be admitted to East wing.
13.13 If an AIIR room is unavailable, the patient shall be admitted to a regular single room with a portable HEPA filter until AIIR is available.
13.14 The decision to cohort patients shall be in consultation with ICHE.
13.15 Use designated portable X-ray equipment and/or other important diagnostic equipment.

14 Infection Control Hospital Epidemiology (ICHE) Responsibilities

14.1 Be available twenty-four (24) hours includes on-call service after hours to respond to infection prevention and control issues.
14.2 Be informed of all suspected and confirmed COVID-19 cases.
14.3 Communicate identified increases in COVID-19 cases both in hospital and nationally to medical affairs as appropriate.
14.4 Assist and provide support/guidance/recommendations in activating the COVID-19 specific preparedness plan and be a member of any associated task forces, as appropriate.
14.5 Lead and mange COVID-19 related outbreaks as per CIPP-687.
14.6 Ensure contingency supplies are available and liaise with appropriate departments.
14.7 Ensure HCWs are provided with appropriate education/awareness.
14.8 Review all transmission-based precaution status for patients screened for COVID-19 in a timely manner.
14.9 Notify and liaise with MOH for positive COVID-19 cases.
14.10 Notify the MOH of any potential family members that require screening as supplied by the admitting units contact tracing log.
14.11 All suspected /confirmed cases must be reported immediately through: Through the Health Electronic Surveillance Network (HESN).
14.12 Complete all in HESN for all positive COVID-19 cases.
14.13 Complete daily follow up report for all confirmed admitted COVID-19 positive cases via HESN.
14.14 Send MOH a weekly report of all COVID-19 suspected cases.
14.15 If a negative COVID-19 test is obtained ICHE staff shall review the duration and type of isolation precautions required based upon a case-by-case evaluation.
14.16 ICHE staff is the only department that shall discontinue isolation precautions, and review suspected/confirmed COVID-19 patients in a timely manner.
14.17 Maintain an updated list of PPE and other vital disposables.
14.18 keep a record of PPE compliance and competency training for all
14.19 healthcare workers; only HCWs who have been trained in PPE usage should care for
14.20 patients with COVID-19.
14.21 Monitor, and observe, and record any breach in PPE use in the incident management
14.22 system as an occupational health and safety risk.
14.23 Ensure all HCWs have received continuous infection control training on COVID-19

15 Medical and Nursing Affairs Responsibilities

15.1 Ensure all HCWs use a fit tested N95 mask and complete a fit check each time they don the mask (refer to CIPP-5110).
15.2 If a patient with suspected or confirmed COVID-19 infection is referred to another health-care facility that facility shall be notified by the referring physician.
15.3 Patients accepted for transfer to KFSH& RC. Gen. Org. from an outside facility shall have a documented negative COVID-19 screen, if tested.
15.4 Accepting a confirmed positive COVID-19 patient shall be on a case-by-case basis; MA shall be informed and permission obtained.
15.5 If the patient is to be admitted, the Head Nurse or Charge Nurse of the receiving unit shall be notified.
15.6 All patients known or suspected with COVID-19 shall have portable x-ray examinations requested.
15.7 Maintain and complete the necessary log for contact tracing.
15.8 A log form shall be kept at the room door entrance area and documented on accordingly.
15.9 The log form shall include the patient's medical record number, unit and bed/room location and current date.
15.10 Each HCW shall document clearly the following details
15.11 Maintain an updated recommendation for the frontline HCWs in the ICU, ER an isolation unit with isolation accommodation, if possible
15.12 Conduct health monitoring for frontline HCWs in the isolation areas and immediately isolate and screen any HCW with COVID-19 associated symptoms.

15.13 Establish a dedicated roster to segregate “clean teams” from “COVID-19 team

VI. Endoscopy Unit Contingency Plan

1. General rules

1.1 All endoscopy staff should comply with infection control measures that will be monitored on regular basis by the head nurse and head nurse assistant.

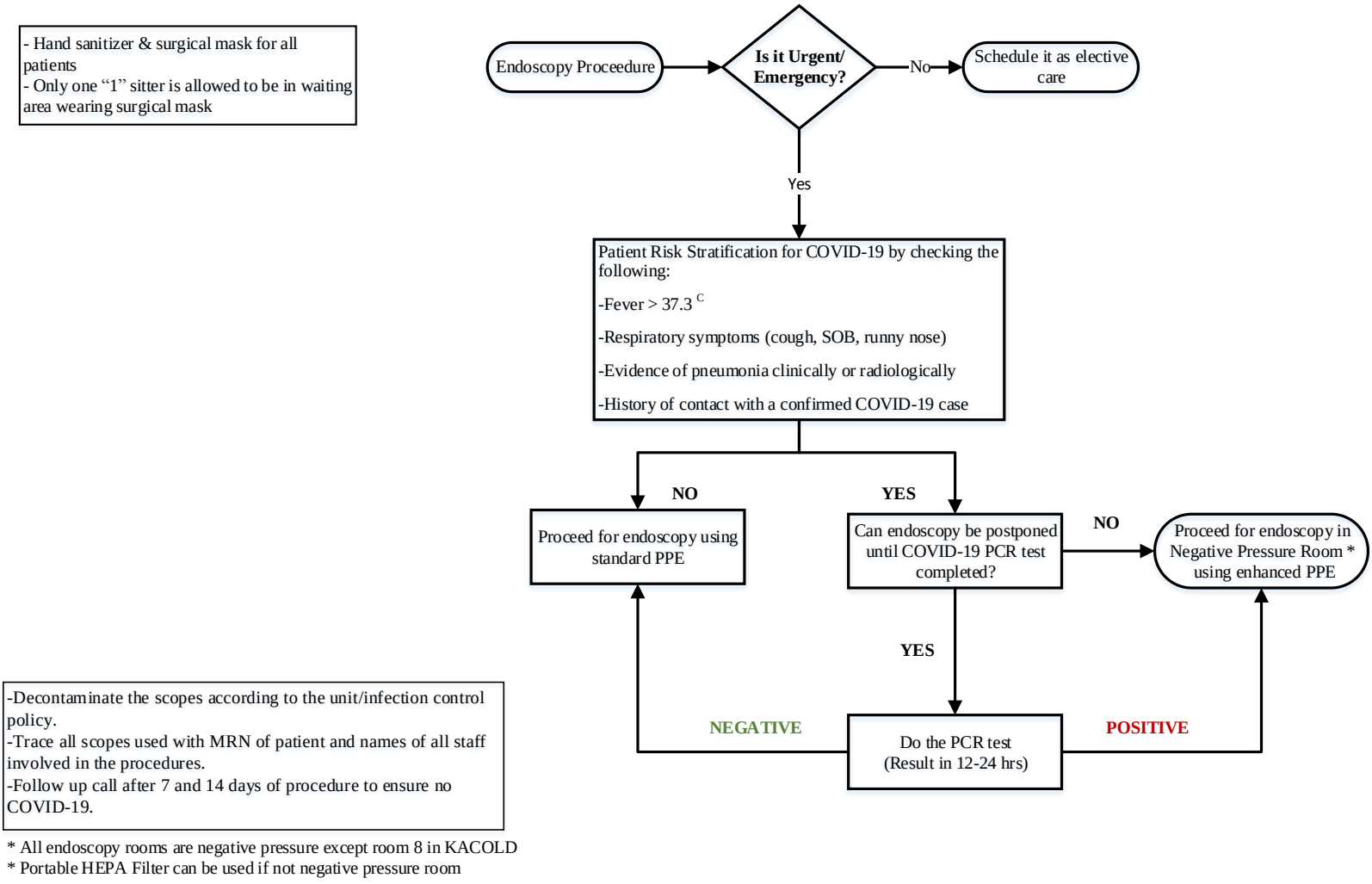
1.2 To minimize transfer of patients between hospital buildings, endoscopy procedures for inpatients should be performed in the same building (east wing, north tower or KACOLD). For outpatients, all endoscopy procedure will be performed in north tower.

1.3 No medical students, interns or residents will be allowed during this period to enter endoscopy unit.

2. Classification of Endoscopic Procedures

Endoscopic procedures should be limited to emergency/urgent cases only. All other cases should be reviewed and rescheduled, to be performed on elective basis after 8 weeks and this might need to be rescheduled further if deemed necessary. (Appendix 3: Table 1 & 2) show classification of cases.

Work flow during COVID-19 outbreak



* All endoscopy rooms are negative pressure except room 8 in KACOLD
* Portable HEPA Filter can be used if not negative pressure room

3. Screening for COVID

3.1 Endoscopy Unit Staff.

If the staff developed any symptoms suggestive of COVID-19 infection such as cough, SOB or fever, the staff should not report to work and inform the head nurse. The staff should report to COVID-19 screening clinic and will be allowed to work if PCR test is negative.

3.2 Patients:

3.2.1 As of April 2020, all patients who are admitted will be tested for COVID-19 PCR test. Endoscopy should be deferred for any positive patient until cured from the infection unless it is an emergency case.

3.2.2 All outpatients coming for endoscopic procedures will be also tested for COVID-19 PCR test 48 hours before procedure day in the external testing center. If the test is (positive), the patient will be called by Infection Control/ER for appropriate action. The endoscopic procedures for such patients should be deferred until the patient is cleared from the infection, however if it is an urgent case, it should be performed in the east wing endoscopy room or north tower, depending on the location of the patient and type of procedure. If the test is (negative), endoscopy coordinator will contact the patient to come to the appointment as planned.

4. Personal Protective Equipment (PPE)

4.1 Endoscopy and anesthesia staff should have fitting test for N95 in advance.

4.2 The use of Personal Protective Equipment (PPE) during endoscopy procedures should be according to risk stratification (Appendix 3: Table 3). Healthcare workers should practice standard infection control and receive adequate training on gowning and removal of PPE according to the hospital graphic instructions.

5. Patients' dress code

5.1 Hands sanitizer and surgical mask should be offered to all patients coming for endoscopic procedures.

5.2 Temperature should be checked and inform the attending physician if the patient is running a fever.

6. Procedure under General Anesthesia (GA)

6.1 Procedures under GA should be limited and performed only when necessary.

6.2 For patients with COVID-19 who require endoscopic procedures under general anesthesia, the procedure should be performed with all healthcare providers in full PPE.

6.3 If possible, GA should be conducted by a designated team on weekly basis.

6.4 GA sessions will be every Sunday, Wednesday and Thursday mornings and limited to 3 patients only (or 2 patients if one of the procedures is ERCP or EUS)

6.5 Each session should be fully booked before opening another session.

6.6 The names of anesthesia team should be kept in records.

7. During procedure

7.1 Cautions should be taken to avoid any splashes from patient.

7.2 The surgical mask has to be removed (except during colonoscopy with nasal cannula under the mask) just before commencing the procedure and replace it once the patient has recovered from sedation and oxygen saturation above 90% on room air.

7.3 Keep endoscope valves and biopsy channel away from your assistant face

7.4 All specimen from patients with COVID-19 should be handled with extra precaution and with appropriate protective equipment.

8. After procedure

8.1 Given that the endoscopy unit is a high-risk area, cleaning of surfaces including stretchers, floors, office tables, doorknobs, and workstations with computers is important and should be performed regularly.

8.2 All serviced that came in contact with patient or staff should be wiped and cleaned according to the unit policy. The cleaning process should include cleaning of all surfaces in the procedure room in order to remove all soil and biofilm, followed by proper disinfection.

8.3 Single use accessories should not be reused and should be disposed of in accordance with institution protocols as biological hazards.

9. Endoscopes disinfection

9.1 Staff should wear gown, gloves, surgical mask and face shield.

9.2 Anti-aerosol screen is better to be provided during manual cleaning.

9.3 Endoscopes will be disinfected as usual with tracing of all endoscopes performed. Disinfectants used for this purpose should be: bactericidal, mycobactericidal, fungicidal, and virucidal against enveloped and non-enveloped viruses.

10. Care givers / sitters

10.1 Relatives of patients are not allowed to enter the endoscopy unit and should stay in the waiting area (keeping minimum of one-meter distance between each other) except in special circumstances in which patient require specific assistance.

10.2 Only one sitter will be allowed per patient to report to endoscopy unit.

10.3 For outpatients' cases, endoscopy coordinator will ask the patient to be accompanied by one sitter only who has no symptoms of respiratory tract infection (runny nose, sore throat, fever, cough and SOB) and has no contact history with COVID-19 confirmed cases in the past 14 days.

10.4 Upon arrival to endoscopy unit, the sitter should use hand sanitizer and wear a mask.

10.5 The sitter will be screened for:

10.5.1 Symptoms of infection (runny nose, sore throat, fever, diarrhea, cough and SOB).

10.5.2 Check his/her temperature.

10.5.3 Positive contact with COVID-19 confirmed case for the past 14 days.

10.6 If any of these is positive, the sitter will be considered as high risk and should not be allowed to enter the unit. If the sitter has an active file at KFSH&RC, he/she will be referred to the screening clinic otherwise the sitter will be asked to report immediately to MOH (937).

10.7 In case patient requires admission after endoscopy and a sitter is needed, he/she should be screened for COVID-19. This will be arranged by contacting the external testing center and the laboratory technician to create encounter for the sitter (if he/she does not have MRN at KFSH&RC). The sitter need to be dealt with as positive case with all the precautionary measures until the result is released.

11. Follow up

All patients underwent endoscopic procedures (inpatient or outpatient) will be contacted by phone after 7 & 14 days to check if the patient or the sitter developed symptoms of infections (mainly fever, cough and SOB) to be reported to infection control.

12. Dealing with infected patients

12.1 If the patient is known infected with COVID-19, all precautions, pre, during and post procedures should be applied according to the hospital infection prevention policy.

12.2 If the patient discovered to be infected (within 14 days) from the procedure time, terminal cleaning for the whole unit then fumigation. The unit afterward can be used.

12.3 For the staff, whoever was inside the room during/immediately after the procedure:

If asymptomatic:

12.3.1 Restrict from work (14 days).

12.3.2 Refer to COVID-19 screening clinic.

12.3.3 If the staff has a separate house, to do self-isolation at home.

12.3.4 If the staff is sharing same housing with other hospital staff, he/she be moved to a dedicated quarantine facility.

12.3.5 If symptomatic: to consult infection control.

13. Inventory management

13.1 The use of medical supplies should be carefully planned.

13.2 The stock and use of consumables, PPE and other equipment should be monitored daily to allow better planning of service and to avoid inadequate supply of PPE, which may jeopardize safety of staff.

13.3 Conservation of PPE is critical and only essential personnel should be present during procedures.

14. Reinstating care after the pandemic

1.1 After the pandemic resolves, services of endoscopy units should attempt to compensate for the time when procedures were suspended in phases where cases are prioritized based on the urgency of procedures.

1.2 Services are reinstated based on the trend of newly infected cases in the community **(Appendix 11: Table 4).**

VII. Care Plan for Hemodialysis Patients During COVID-19 Pandemic

These recommendations are to be used in addition to KFSH&RC guidelines for the treatment and prevention of COVID-19 infection. These measures should provide guidance to patients, health care professionals, and Renal Dialysis Unit staff in line with the already approved Standards of Care of the Hemodialysis Patients and the Scope of Service.

1. Precautionary Measures for Hemodialysis Unit

1.1 Patients

1.1.1 All outpatient Hemodialysis patients should stay home on non-hemodialysis days.

1.1.2 Patients should be advised to following the advice of the hygienic measures provided by the Ministry of Health (MOH).

1.1.3 The patients should report any of the following symptoms (fever, cough, headache, difficulties in breathing) and/or contact with the COVID-19 person prior to their appointment.

1.1.4 If a patient present with the aforementioned, he/she should go l be advised to attend the Emergency Department.

1.2 Hemodialysis Healthcare Provider

Hemodialysis RDU staff will follow the policies and guideline provided by KFSH&RC in line with best practice from Infection Control.

1.2.1 Phone Triage

1.2.1.1 RDU nurse will be phoned prior to their scheduled appointments; the patient will be assessed over the phone in line with the SARI guidelines as per KFSH&RC in line with the MOH.

1.2.1.2 If the patient triggers a score of =/>4 for MERS and =/>6 for COVID-19 they will be referred to the Emergency Department.

1.2.1.3 When the patient reaches the hospital with a score is less than 4 for MERS and less than 6 for COVID-19 he/she will then be screened on the hospital grounds/entrance before presenting to the dialysis unit.

1.2.1.4 If they confirmed there is no symptoms and score is within range they will present to the dialysis unit and a second screening will be done in the HD screening Room by HD staff.

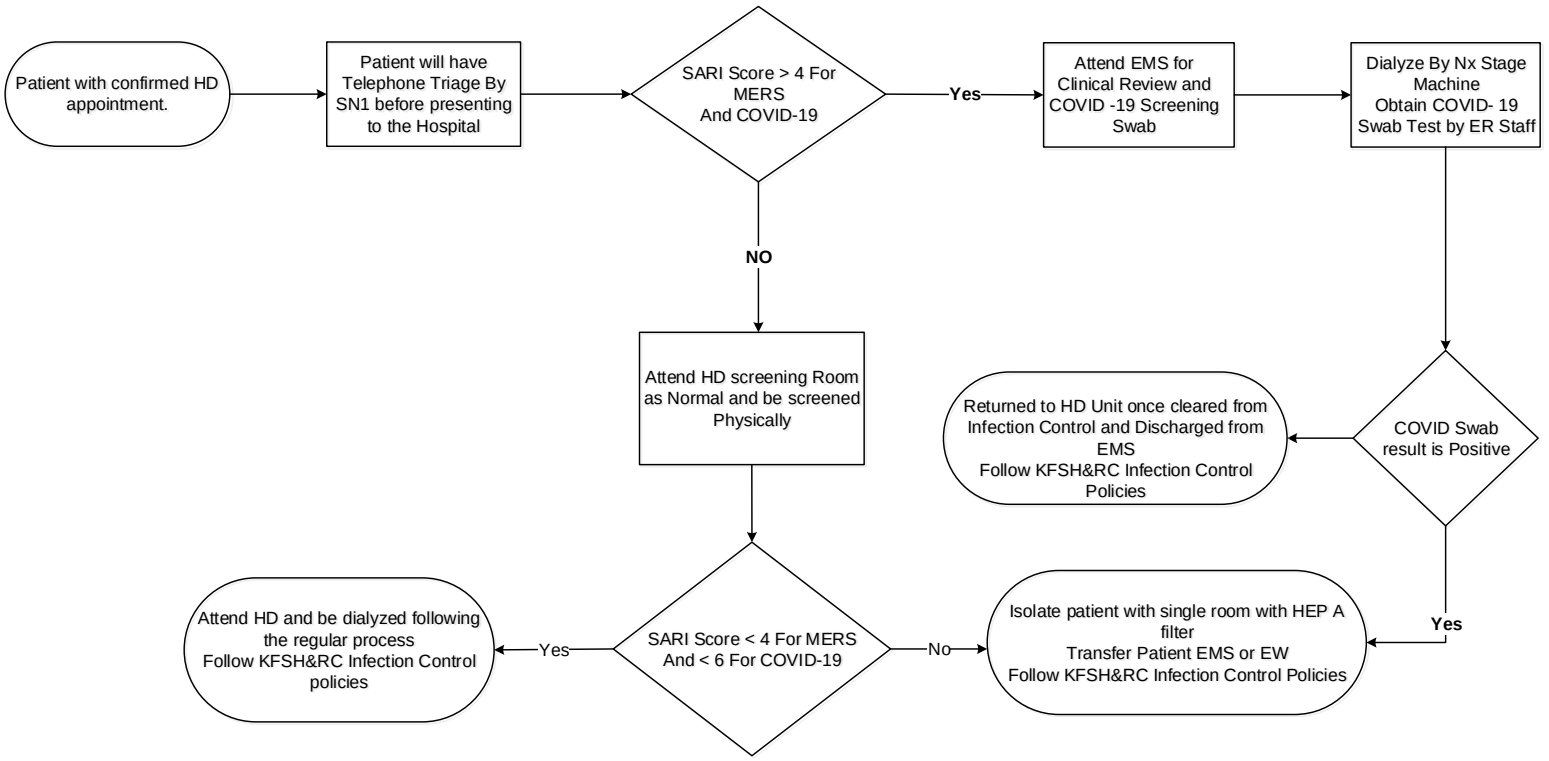
1.3 Screening on Arrival to the Hemodialysis Area

1.3.1 If the patient and the sitter presents physically with signs and symptoms and is clinically unwell and triggers a score of =/>4 for MERS and =/>6 for COVID-19 s/he will be referred to the Emergency Department and will be in line with KSHRC guidelines from Infection Control.

1.3.2 At least 6 feet of separation should be maintained between masked patients who are symptomatic and others.

1.3.3 The patient will be admitted then to the Hemodialysis Unit if they are less than score of 4 for MERS and less than 4 in SARI for COVID-19 (see below flowchart).

Hemodialysis (HD) Unit Patient Screening Flowsheet
(Adult and Pediatric)



1.4 Care of Hemodialysis Patients Suspected to have COVID-19

1.4.1 If the Hemodialysis patients will be phoned prior to their scheduled appointments, the patient will be assessed over the phone in line with the SARI guidelines as per KFSH&RC in line with the MOH.

1.4.2 If the patient triggers a score of =/>4 for MERS and =/>6 for COVID-19 they will be referred to the Emergency Department.

1.4.3 These patients should be placed in separate room under contact and droplet precautions. Negative pressure room or single room with a HEPA filter is required for patients undergoing aerosol generating procedures like nasal swabbing or suctioning. Discuss with nephrologist and contacting ED physician and infection control team, the patient is sent to the ED designated COVID-19 area for testing, and assessment for alternative causes of symptoms.

1.4.4 If postponement of dialysis is not possible, the patient should be dialyzed in the ED or on Nx. Stage portable HD machine (if available) until a suitable location for isolation is identified.

1.5 Care of Hemodialysis Patients Confirmed to have COVID-19

1.5.1 If the patient is confirmed as a COVID-19 positive patient, then the patient should be admitted to the East Wing preferably to an area with Hemodialysis ports **(see appendix 1).**

1.5.2 This is essential to the renal failure patient as home isolation is not a practical measure or safe measure for the patients requiring dialysis 3 times a week.

1.6 Treatment Options for Dialysis

1.6.1 Intermittent Hemodialysis 5008– 6008 Dialysis Machine or the Nx. Stage Machine

1.6.2 Continuous Renal Replacement Therapy - (CRRT) – will be used in the in the Intensive Unit pending the patient acuity.

1.6.3 If the patient requires dialysis in the Critical Care Unit CRRT is the first line treatment regardless of the acuity.

1.6.4 The Critical Care nurse will set up the CRRT machine to reduce the need for Hemodialysis exposure to COVID-19 and potential for cluster group.

1.6.5 Hemodialysis Nurses will provide support as required.

1.6.6 In general, all COVID-19 cases are quarantined and the decision for any emergent procedure related to dialysis access will be made by the covering nephrology team.

1.6.7 If a procedure is needed to be done in the OR, it will be done in the designated OR rooms and will be handled by the trained OR team **(please see Flow Map- Activation of OR Process for COVID-19 Patient)**

1.7 Machines Disinfections

1.7.1 There is no recommendation for any additional disinfecting of the dialysis machines.

1.7.2 The machines will follow the current Standard of Care Guidelines in relation to disinfection unless there is new information that emerges as to what will be best practice.

1.8 Nursing and Medical Staffing Cover

1.8.1 Nursing

1.8.1.1 For KFSHRC RIYADH. There is a designated nursing team assigned to the East Wing or designated area have a surge plan in place when if and when the need arises **(Appendix 11)**

1.8.1.2 For KFSHRC Jeddah. The RDU nurses are covering the RDU 24h and ICU /CCU and 5th floor in patient wards when needed.

1.8.2 Medical

1.8.2.1 Nephrologist will cover the COVID-19 patients in East Wing KFSHRC RIYADH (RDU in JEDDAH) or designated area who needs care and treatment.

1.8.2.2 There will be effort made to minimize the exposure of the team in an effort to reduce spread of infection and exposure risk.

2. Precautionary Measures for PD Patients:

People on PD should stay at home. Hospital visits should be minimized for only urgent indications (e.g. suspected peritonitis). Health care providers should otherwise be conducted remotely by "Telework".

2.1 Pre-clinic screening for suspected cases

- Perform preliminary screen for COVID-19 to all PD patients planning for hospital visits by phone
  - Have they got symptoms?
  - Have been unwell with fever?
  - Have acute respiratory infection (e.g. shortness of breath, cough or sore throat) with or without a fever?
  - Has someone in their family got COVID related symptoms?
  - Have they been in contact with someone who has developed COVID in the last 2 weeks?
  - Do they have any travel history in the last 14 days?

- If the patient meets the risk criteria or if they have been unwell with a fever or cough,
  - Advise the patient to make contact with Ministry of Health on 937.
  - If it is clinically necessary for the patient to attend the PD unit (e.g. suspected peritonitis), the patient should be seen with appropriate infection control procedures (see below)

2.2 Management in PD Unit

2.2.1 Non-essential procedures e.g. PET, clearance measurement etc, should be avoided during the pandemic to minimize unnecessary patient contact

2.2.2 One person is allowed to accompany the patient during the clinic visit.

2.2.3 Patient and the accompanying person are screened before entering the hospital premises and they are screened again physically before entering the PD clinic.

2.2.4 People at the waiting area should be arranged at least 2m apart.

2.2.5 Once determined as having potential exposure to the virus, or COVID-19 related symptoms, patients should be sent to emergency department to have the necessary viral swabs by the designated team.

2.2.6 All individuals should perform hand hygiene properly with alcohol-based hand sanitizer before they enter the clinic area.

2.2.7 Design a one-way, quick workflow in the PD clinic visit, including completing all patients needs as answering clinical questionnaires, exit-site check, physician consultation, prescription adjustment, drug prescribing, home delivery request needed and supplies from medical store.

2.2.8 Patient visits should be kept to a minimum and should only be for essential issues such as peritonitis, severe exit site infection, hole in the PD line, malfunctioning of the PD catheter, or training new patients. Control the number of patients per clinic session and speed all procedures done during the clinic visit to reduce the number of patients in the clinical and waiting area.

2.2.9 Individuals should perform hand hygiene when leaving the consulting room after their brief interaction with healthcare providers.

2.3 Home-PD management

2.3.1 Patients are required to have at least 2 months PD supplies and sufficient medications in case they have to self-isolate, or there is a break in the supply chain (e.g. due to delivery staff sickness)

2.3.2 All home visits by healthcare professionals should be stopped

2.3.3 Patients and their family members are advised to stay at home and limit social activities and gathering to decrease the risk of contact with confirmed or suspected cases of COVID-19.

2.3.4 Patients or their family members with epidemiological history should inform the PD unit by phone and begin self-quarantine for at least 14 days.

2.3.5 Patients and their family members should practice social distancing and are advised in general to avoid unnecessary touching when going outside or meeting together

2.3.6 Strengthen education of hand hygiene with liquid soap, washing for at least 20 seconds, and alcohol-based hand sanitizer.

2.3.7 Patients should report their symptoms and exposure to coronavirus honestly to health workers

2.3.8 Telework and remote patient management (RPM) is strongly recommended and applied as the major way to manage patients on PD.

2.3.9 PD Nurses should communicate with patients frequently, to distinguish and handle the most dangerous and severe cases in a timely manner. Unexpected or emergency visits should be avoided as much as possible.

2.4 Hospitalization of PD patients

2.4.1 Elective and non-urgent admissions should be rescheduled, and inpatient elective surgical and procedural cases should be delayed.

2.4.2 Screening for suspected and confirmed cases with COVID-19 should be performed for everyone before hospitalization

2.4.3 Inpatient clinical visits are very limited by the on call nurse. One way and quick workflow is applied.

2.4.4 If PD nursing team is involved with inpatient care, it is preferable to have separate teams responsible for inpatient and outpatient PD care.

2.5 Diagnosis and treatment of COVID-19 for PD patients

2.5.1 Management of COVID-19 infection is the same for PD patients as for all other patients

2.5.2 Mild or moderate patients on PD can continue PD treatment as usual, with prescription adjustment according to general evaluation.

2.5.3 Severe or critically severe cases requiring life support due to multiple organ dysfunction syndrome can be temporarily transferred to bedside continuous renal replacement therapy (CRRT).

2.5.4 Follow the standard methods for Disposal of the drained dialysate from PD patients with COVID-19

3. Precautionary measures for PD staff

3.1 Continue education and training of knowledge about COVID-19

3.1.1 Healthcare staff should be educated with the latest knowledge of the disease on a regular basis, since information regarding COVID-19 is continually being updated.

3.1.2 PD staff are informed about the local COVID-19 situation. The facility's emergency plan is developed and reviewed accordingly.

3.2 Epidemiological history surveillance and self-monitoring for COVID-19 for individual healthcare staff

3.2.1 Any member of staff in close contact with someone who has developed symptoms suggestive of COVID 19, or who develops suggestive symptoms should self-isolate for 14 days' quarantine isolation.

3.3 Personal protective equipment (PPE) and hand hygiene

3.3.1 PPE should be available for all members of the PD team and used accordingly depending on nature of contact with patient.

3.3.2 Hand hygiene should be performed (a) before and (b) after every patient contact, (c) after body fluid exposure or risk, (d) after touching a patient's immediate environment, (e) before clean/aseptic procedures, (f) before wearing and (g) after removing PPE.

3.3.3 Continuous education, supervision and update regarding the importance and the recommended approach to hand hygiene.

3.3.4 Necessary equipment such as sufficient number of sinks with soap dispensers, paper towels, and alcohol-based hand sanitizer are provided in the dialysis unit.

3.4 Medical activities and staffing

3.4.1 Team meetings, including unit meetings, centralized learning and education, case discussions including annual reviews, pediatric collaborative meetings, transplant collaborative meetings should be avoided. Instead, telephone and video-conferencing should be used to communicate with each other if necessary.

3.4.2 Precautionary measures with social distancing should be taken in daily life

3.4.3 Healthcare staff are required to receive adequate rest. Sick employees are told and reminded to stay at home.

3.4.4 The hospital and dialysis leadership should address and continuously pay attention to both the mental and physical health of the staff.

3.5 Environment cleaning

3.5.1 Environment service personnel are responsible for cleaning and disinfection of high-touch surfaces of the PD unit, using the PPE recommendations when cleaning and disinfecting the environment and items. PPE should be removed upon leaving the PD unit, immediately followed by performance of hand hygiene.

3.5.2 All rooms should be ventilated by an air conditioner in each dialysis room to ensure air circulation.

3.5.3 All surface of objects and floor should be wiped and disinfected thoroughly before and after each patient visits. Desk surfaces, computer screens and keyboards in office areas should also be disinfected daily and between users

3.5.4 Perform terminal disinfection immediately with the assistance of infection control experts if there are confirmed or highly suspected cases of COVID-19 in the dialysis unit.

3.5.5 Medical waste generated by confirmed or suspected patients of COVID-19 should be disposed in accordance with the hospital regulations.

VIII. Operative Room and Cath Suites

Surgical procedures during infectious outbreaks are among the high risk hospital activities and precautionary steps needs to be undertaken.

The following guidelines are to be utilized in conjunction with the flow map issued by OR management (Ref: POS/384/41).

The following are recommended:

1. What cases need to be done during COVID-19 pandemic:

1.1 **Emergency cases:** where patients' lives will be most probably affected by the disease (lifesaving and limb saving surgeries should be continued in COVID-19 known/unknown patients with precautions in place).

1.2 **Urgent cases:** where outcome of the disease management will be affected negatively by delay of surgical procedures.

While the 1st category is mostly clear, the second one needs an agreement among departments and prioritization.

- Stratification of risk is advised to be done by Departments. Benchmarking is recommended ("American College of Surgeons Guidelines: **ACS: COVID-19 elective case triage guidelines**")
- Departments are to ensure availability and utilization of resources based on such stratification
- In general, any procedure that can be delayed should not be done. Specifically, cases that will need ICU post-operatively may need to be delayed, lesser intervention to be considered, or allowed carefully owing to the fact that ventilator need is usually exponential in such circumstances.

2. Preoperatively:

2.1 Emergency:

2.1.1 Manage as positive for COVID-19

2.2 Elective: the following needs to be addressed

2.2.1 Testing for every patient 24-48 hrs. prior to admission. If positive: COVID Care plan, and surgery cancelled.

2.2.2 Need for ICU post-operatively

2.2.3 Utility of lesser interventions

2.2.4 Review guidelines periodically in the context of the outbreak

2.3 OR suite preparations and patient flow:

2.3.1 Develop a dedicated COVID-19 operating room and pathway for transportation different from the main area of operations

2.3.1.1 Since we have no available negative pressure OR suites and turning the positive pressure is risky, rooms are to be kept on full positive ventilation and exercise strict use of PPE as outlined below. The latter is an acceptable safe practice (UK guidelines).

2.3.2 Early notification of OR management of procedure and status of patient to ensure OR readiness

2.3.3 Direct transfer of patients confirmed or suspected COVID-19 to OR suite. Patients to be covered with clean sheet and put on surgical mask if tolerated. Transport team to wear gowns, gloves, appropriate surgical masks

2.3.4 Designate a room and area away from high traffic zone in the OR, creating a pathway from ICU to the operating room that can be emptied and cleared during transportation. Simulation should be done to prepare for operating on a COVID-19 positive patient in an emergency setting

3. Intraoperatively:

3.1 Emergency and COVID-19 positive patients:

3.1.1 Patient induction, intubation: Ideally to be performed in negative pressure room. At KFSHRC, negative pressure rooms are only available in recovery rooms area. If not feasible, other option is to do intubation in OR with complete infection control precautions as indicated below.

3.1.2 Allocate an area for donning and doffing of PPE in OR

3.1.3 Unnecessary items should not be brought in to the room such as mobile, pens etc.

3.1.4 Reduce traffic in the OR room from all disciplines with runner outside to get the equipment needed inside with exchange happening through carts

3.1.5 Reduce the staff in the operating room to essential only

3.1.6 Cautious intubation with appropriate PPE

3.1.7 Smoke extraction (if applicable)

3.2 Urgent elective and COVID-19 negative patients:

3.2.1 Such procedures are performed following the universal OR precautions with emphasis on extra attention to the general guidelines and proper PPE.

4. Postoperatively:

4.1 Cautious extubation with appropriate PPE

4.2 Transfer to recovery/ICU with maximum isolation measures

4.3 designated recovery area for positively tested/suspected patients

4.4 appropriate usage of PPE by staff in recovery room

4.5 careful handling of patients and proper sign-in and sign-out process

4.6 Terminal cleaning and disinfection of OR with hydrogen peroxide after surgery by environment services

5. Use of Personal Protective equipment (PPE):

5.1 Patients with negative PCR or Not suspected for COVID-19

5.1.1 As per usual surgical guidelines

5.2 Patients suspected or positive COVID-19 (has symptoms, test pending, or positive) in droplet precautions in theater OR for Non-Aerosol generating procedures (local anesthesia, neuraxial block low risk for GA)

5.2.1 Fit tested, fit checked N-95 respirator

5.2.2 Powered Air Purifying Respirator (PAPR) if not fit-tested/failed fit-testing or have facial hair

5.2.3 Sterile gown and gloves

5.2.4 Double head cover

5.2.5 Goggles or face shield

5.2.6 Waterproof gown

5.2.7 Shoe cover

5.3 Aerosol generating Procedure on patients positive or suspected for COVID-19 and airway procedures on All patients not tested for COVID-19

5.3.1 Fit tested, fit checked N-95 respirator
5.3.2 Powered Air Purifying Respirator (PAPR) if not fit-tested/failed fit-testing or have facial hair
5.3.3 Face shield
5.3.4 Goggles or face shield
5.3.5 Gloves (consider double)
5.3.6 Fluid resistant long sleeve gown
5.3.7 Sterile Surgical gown
5.3.8 Double head cover
5.3.9 Shoe cover

5.4 All surgical team members should be educated on personal protection equipment and management of cases

6. General Considerations:

6.1 Hand hygiene should be strictly preformed in and out of the operating room
6.2 Wear of Surgical mask inside the OR for all personnel at all times
6.3 Cautious intubation/ extubating with minimal personnel in the room (anesthesiologist and assistant)
6.4 Smoke extraction in cautery machines
6.5 Keep staff to minimum
6.6 Careful handling of patients and proper sign-in and sign-out process
6.7 Laparoscopic/endoscopic/ procedures Should be kept to minimum in general (open or lesser mitigating options to be considered) due to risk of aerosol exposure. If such procedures are deemed necessary, surgeons should ensure usage of devices to filter released CO2 for aerosolized particles
6.8 Low power settings for electrocautery
6.9 Prevent/manage aerosol dispersal
6.10 Strict postoperative cleaning and disinfection of OR and equipment in patients positive or suspected for COVID-19

Flow Map- Activation of OR Process for COVID-19 Patients

	For patients from Isolation ward/ICU: To give 30 minutes grace time for ward nurse to send patients to OR. Ward/ICU nurse to activate security &/or ambulance	Front Desk Nurse	OR Runner (Outside)	OR Nurse (Circulatory/ Scrub)	Anesthesiologist & anesthesia Tech	Housekeeper
Preparation Phase		Activate Team ↓ Communicate with Pharmacy to confirm preparation of the Medication kit (Senior staff only-Consultant/Assistant/ Fellow) ↓ Handover pouch to OR runner with the following: -Mobile phone -PPE cupboard key - Card access	Place infection control tags on doors and close corridor doors ↓ Place equipment on PPE trolley near the room ↓ Open and wait at the card access door to receive the pre-op patient	Don full PPE and/or PAPR ↓ Prepare OR accordingly ↓ Scrub nurse to scrub up and prepare trolley ↓ Circulating nurse to pass all additional consumables/ instruments to OR Runner (Before patient enters OR) ↓ Park patient's trolley in Ante room after transfer *** Refrain from entering the induction/prep room unless absolutely necessary***	Nurse ensure adequate PAPR available and functioning ↓ Done full PPE and PAPR ↓ Place drug tray and airways adjuncts on respective designated trolley	
INTRA-OPERATIVE Phase			Place aby requested items on a trolley into Ante room	Unused consumables/drugs placed in OR intra-op must be thrown away Contact OR runner if require any other items. Receive requested items from Ante room		Wipe patient's trolley (especially siderails)
POST-OPERATIVE Phase		Facilitate transfer of patient post-operatively as follow: * Circulating nurse and anesthesia to send patient back isolation ward, (Activate security 30 mins prior to discharge) * Circulating nurse and anesthesia to send patient back to ICU, (activate security 30 mins prior to transfer)				
				Specimen handling: As per MERS-COV Policy	As per MERS-COV Policy	
		Disinfection guidelines:		As per MERS-COV policy		Removal of PPE and PAPER
Follow up phase		All specimens to be sent to pathology with labels clearly stated if airborne or COVID-19 Replenish supplies and prepare OR in readiness. all personnel must shower after case				

IX. Home isolation

1. The decision to restrict the activities of persons suspected of being infected, or to separate them from others, depends on the assessment of the level of risk of transmission. For COVID-19, this is largely dependent on exposure risk categorization (page 27).
2. Isolation is defined as the separation or restriction of activities of an ill person with a contagious disease from those who are well.
3. Before the ill person is isolated at home, a health care professional should assess whether the home is suitable and appropriate for isolating the ill person You can conduct this assessment by phone.
4. The home should have a functioning bathroom. If there are multiple bathrooms, one should be designated for the ill person.
5. The ill person should have his or her bed and a private room for sleeping.
6. For close contacts including health care workers

6.1 If you have had close contact with someone who is infectious and being evaluated for COVID-19 infection, you should monitor your health for 14 days, starting from the day of exposure. Watch for symptoms of Fever (37.8° C, or higher), coughing, shortness of breath, chills, body aches, sore throat, headache, and runny nose.

6.2 If you develop symptoms, follow the prevention steps described above, and call your healthcare provider (Family Medicine clinic) as soon as possible.

3. If you do not have any of the symptoms, you can continue with your daily activities and follow instructions of ICHE.

7. If the home is suitable and appropriate for home isolation, follow these instructions

7.1 Separate yourself from other people in your home

7.2 As much as possible, you should stay in a different room from other people in your home. Also, you should use a separate dedicated bathroom, if available.

7.3 Call ahead before visiting hospital Before your medical appointment, call the hospital and tell them that you may have a COVID-19 infection. This will help the healthcare facility takes steps to keep other people from being infected.

7.4 Wear a surgical mask You should wear a surgical mask when you are in the same room with other people and when you visit a healthcare provider. If you cannot wear a surgical mask, the people who live with you should wear one while they are in the same room with you.

7.5 Cover your coughs and sneezes Cover your mouth and nose with a tissue when you cough or sneeze, or you can cough or sneeze into your sleeve. Throw used tissues in a lined trash can, and immediately wash your hands with soap and water or with alcohol-based hand sanitizer.

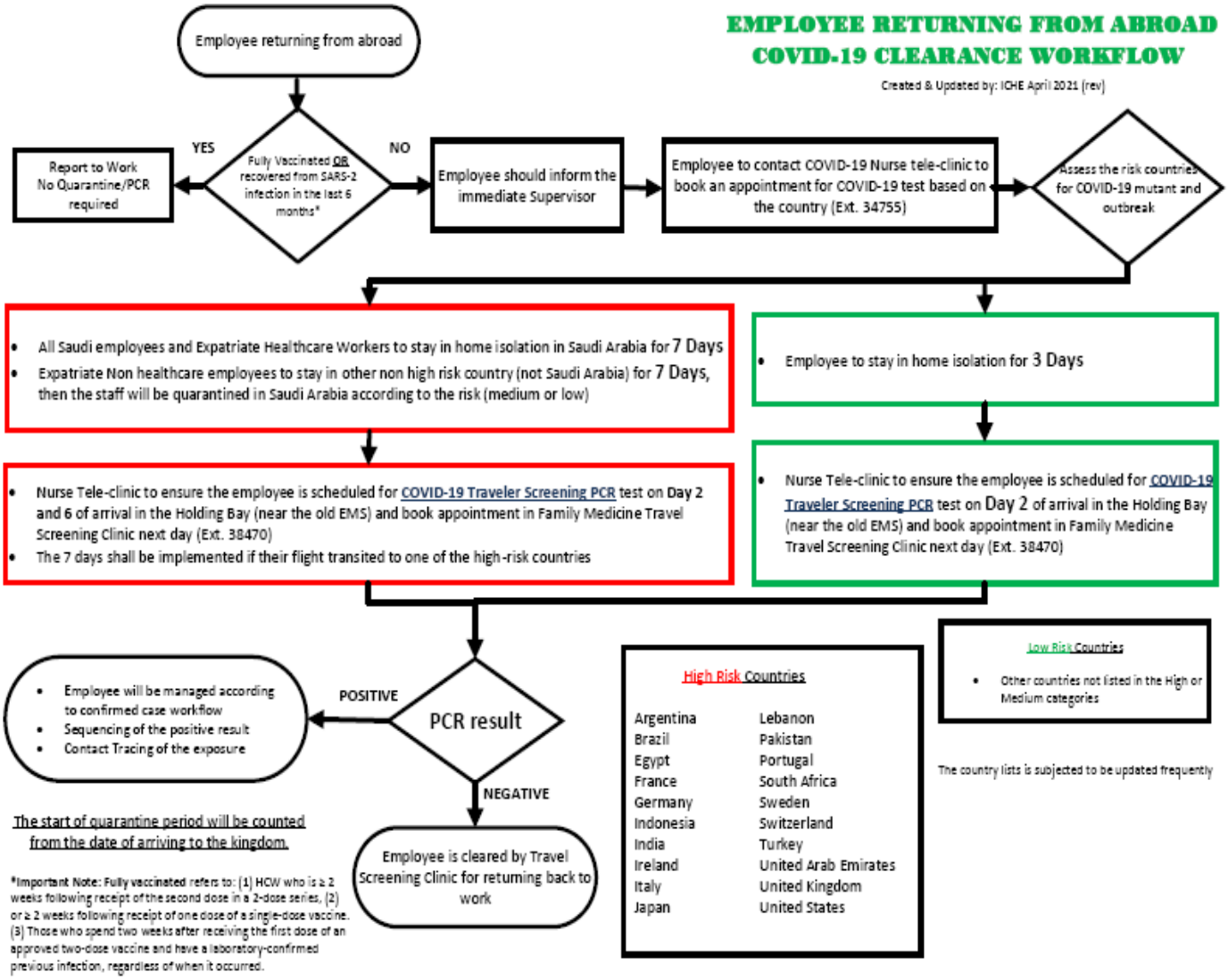
7.6 Wash your hands often and thoroughly with antiseptic soap and water. You can use an alcohol-based hand sanitizer if antiseptic soap and water are not available and if your hands are not visibly dirty.

7.7 Avoid touching your eyes, nose, and mouth with unwashed hands.

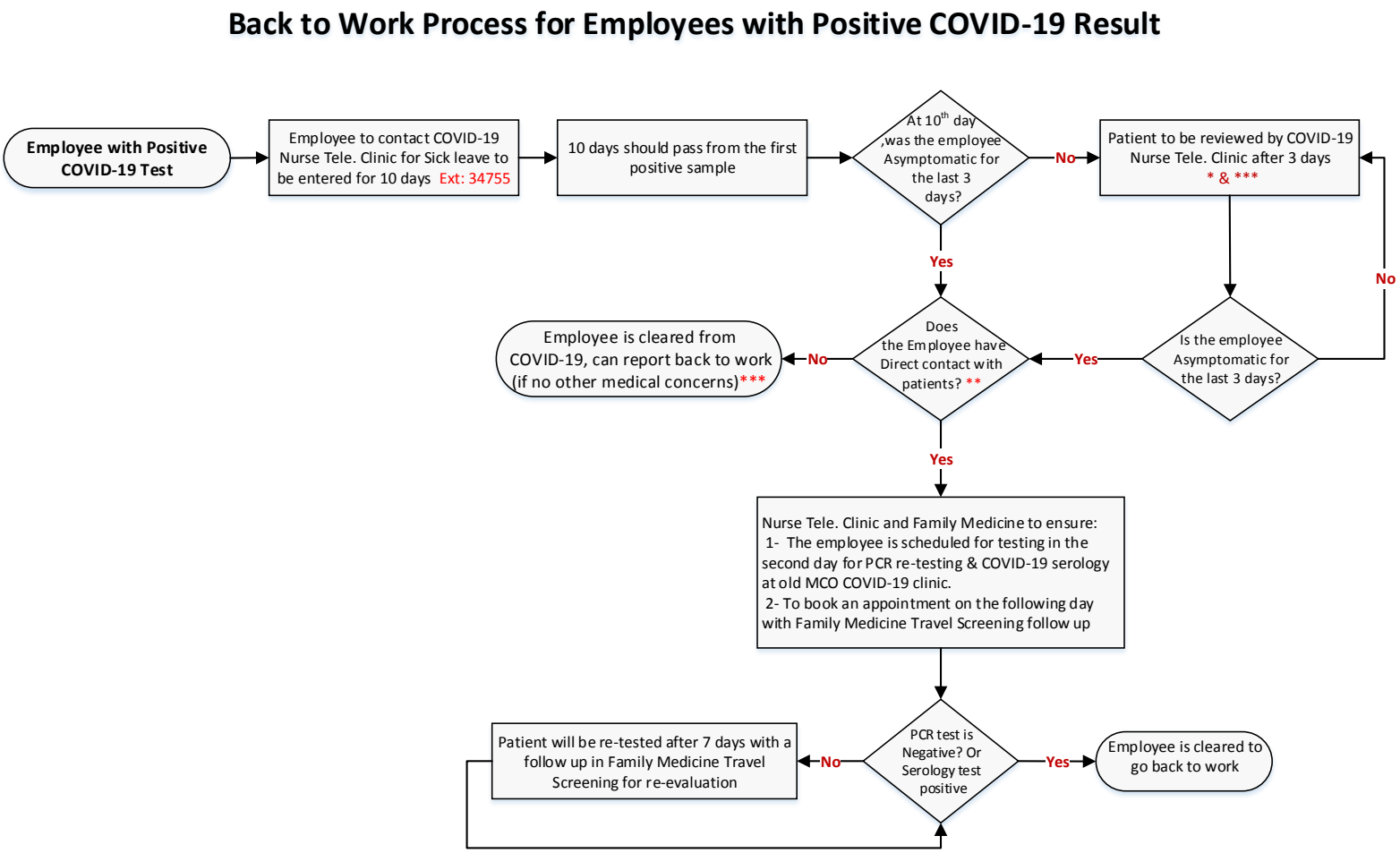
7.8 Avoid sharing household items

7.9 You should not share dishes, drinking glasses, cups, eating utensils, towels, bedding, or other items with other people in your home. After using these items, you should wash them thoroughly with soap and warm water.

X. Employee Returning from Abroad Workflow

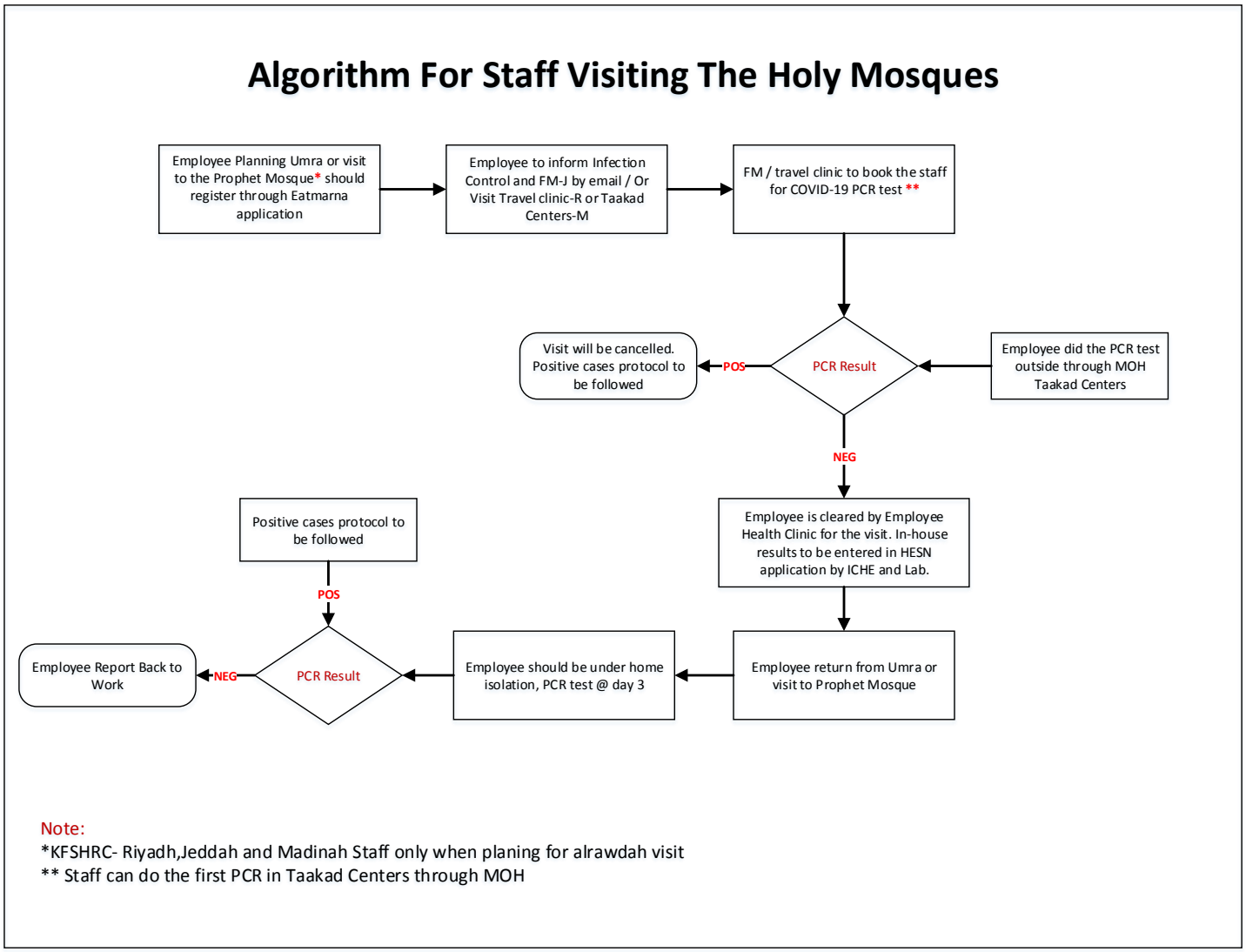


XI. Back to Work Process for Employees with Positive COVID-19 Result

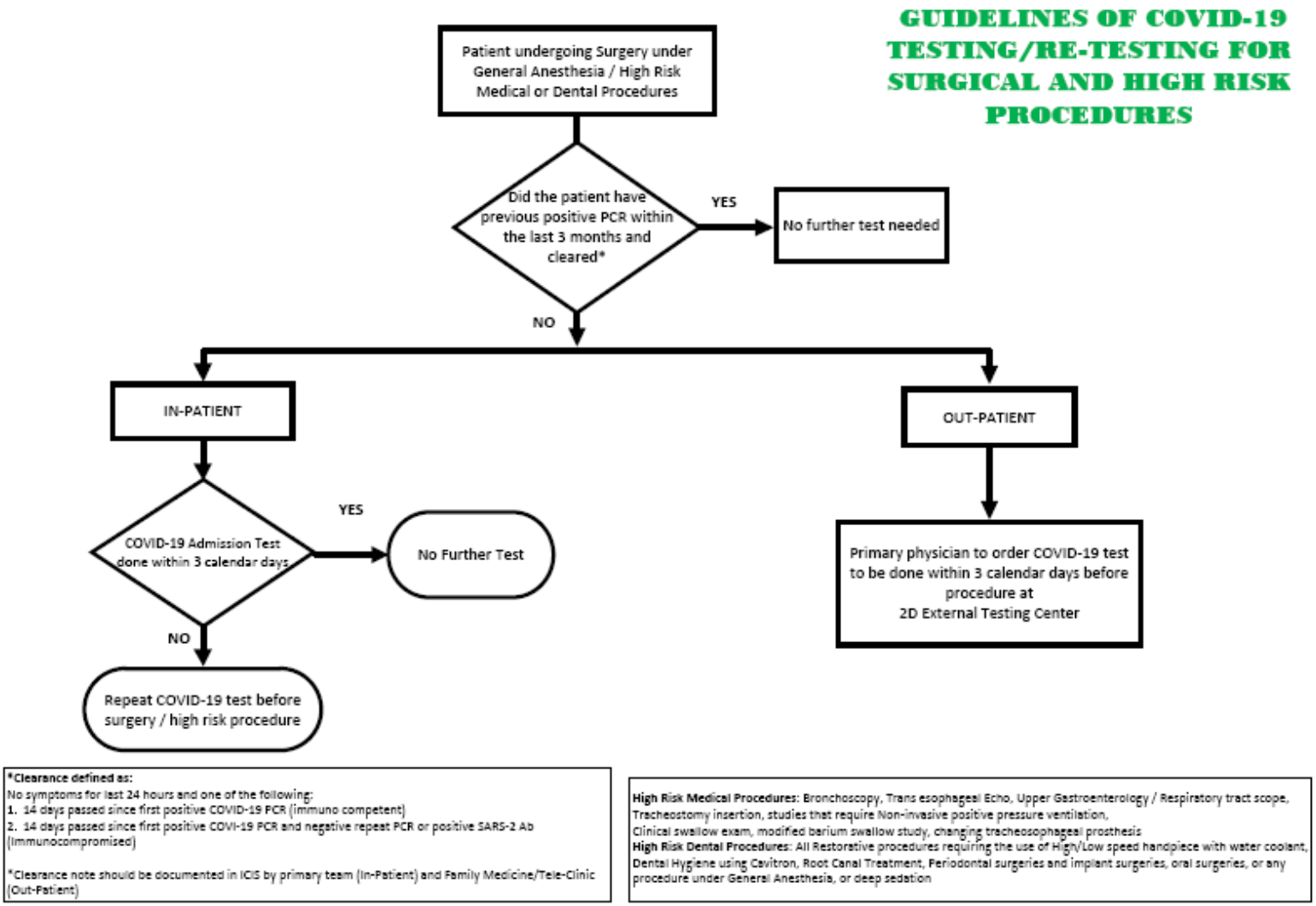


*Extension of the sick leave should be requested by the COVID-19 Nurse Tele. Clinic
**Staff with direct contact with patients include: 1-Physicians, 2-Nurses, 3-Clinical services, 4-Pathology/ laboratory.
***To Book the patient in the Family Medicine Travel Screening clinic if there are any medical concerns
Note:
Employee should not come to the hospital premises until they are cleared

XII. Algorithm For Staff Visiting The Holy Mosques



XIII. Guidelines of COVID-19 Testing and/ Re-Testing for Surgical and High Risk Procedures



XIV. Exposure Risk Categorization and Management

1. <u>Close contact:</u>
   - 1.1. Within 1.5 meters, of a person with COVID-19 for a prolonged period of time (such as caring for or visiting the patient; or sitting within 1.5 meters of the patient in a healthcare waiting area or room) duration of time that constitutes a prolonged exposure is not clear yet. However, until more is known about transmission risks, it is reasonable to consider an exposure greater than a few minutes (may be 5 - 10 minutes) as a prolonged exposure. Brief interactions are less likely to result in transmission.
   - 1.2. Being in household contact with a COVID-19 patient.
   - 1.3. Being in close proximity or sharing the same closed area (e.g. Room, kind of transportation vehicle) with a COVID-19 patient.
2. <u>Risk Category</u>
   - 2.1. High Risk:
     - 2.1.1. Health care worker who interact with a COVID-19 patient without wearing appropriate personal protective equipment (PPE) as per hospital guidelines (Table-1).

2.1.2. Health care worker who had direct unprotected contact with a COVID-19 patient's fluid or respiratory secretions (e.g., splash on mucus membrane or non-intact skin, being coughed on, touching used tissues with a bare hand)

2.1.3. Living in the same household or providing care for COVID-19 patients in non-health care settings

2.2. Low Risk: Any contact that not fitting close contact definition or health care provider exposure as per in Appendix 5

2.2.1. High-risk (unprotected exposure) or did not complete Vaccine: final testing after 5 days from last exposure.

2.2.2. Low-risk unprotected exposure) or did not complete Vaccine: testing after 24 hours from last day of exposure.

2.2.3. Protected exposure or Vaccine complete status: no testing.

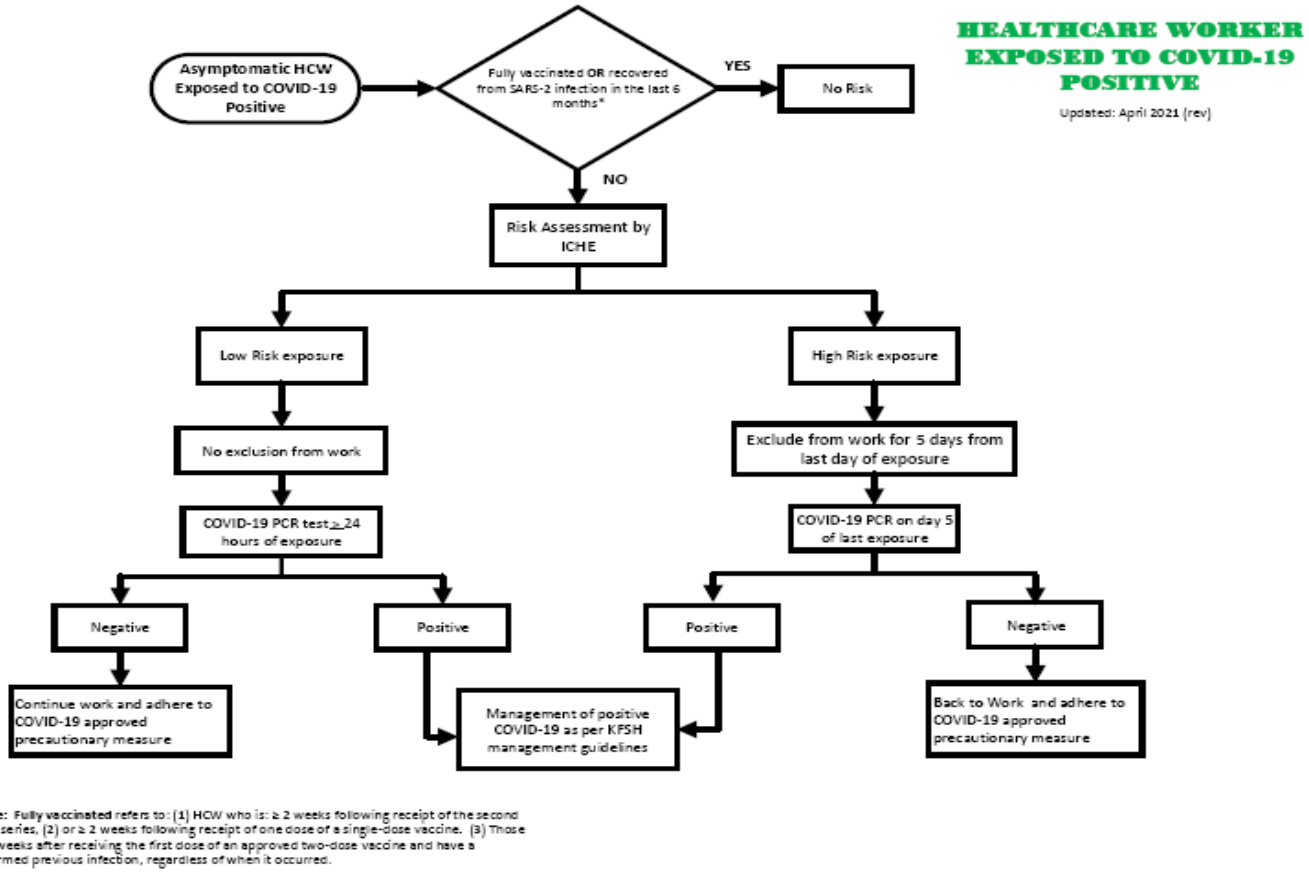
2.2.4. Completed vaccine staff who are exposed to confirmed cases will always be considered as No risk (continue

2.2.5. Completion of vaccine means:

2.2.5.1.1. Who has spent two weeks after receiving the second dose of an approved two-dose vaccine (Pfizer or AstraZeneca)

2.2.5.1.2. Those who spend two weeks after receiving the first dose of an approved two-dose vaccine and have a laboratory-confirmed previous infection, regardless of when it occurred

3. Exposure Management:



*Important Note: Fully vaccinated refers to: (1) HCW who is: ≥ 2 weeks following receipt of the second dose in a 2-dose series, (2) or ≥ 2 weeks following receipt of one dose of a single-dose vaccine. (3) Those who spend two weeks after receiving the first dose of an approved two-dose vaccine and have a laboratory-confirmed previous infection, regardless of when it occurred.

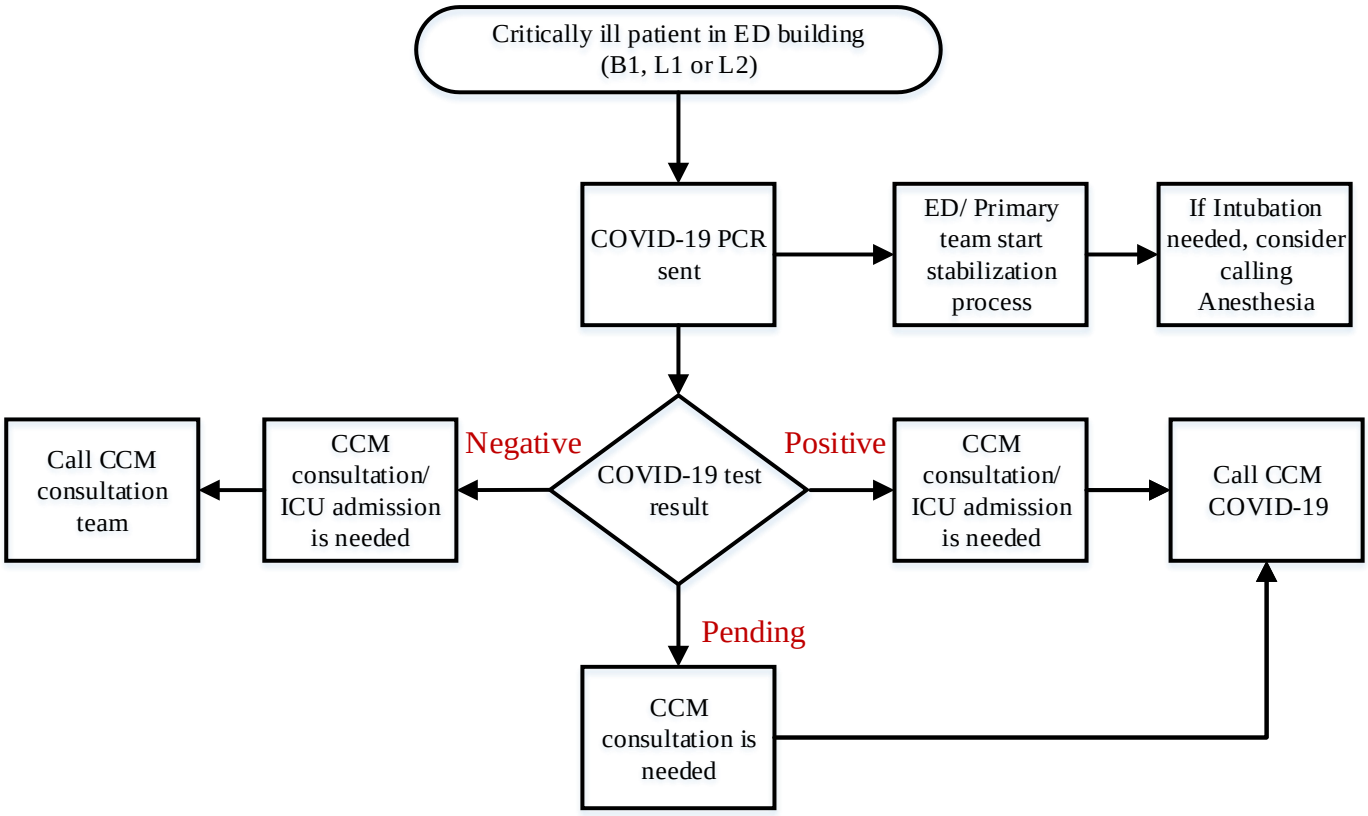
XV. Assessment of suspected or confirmed COVID-19

1. Admission from Emergency Department

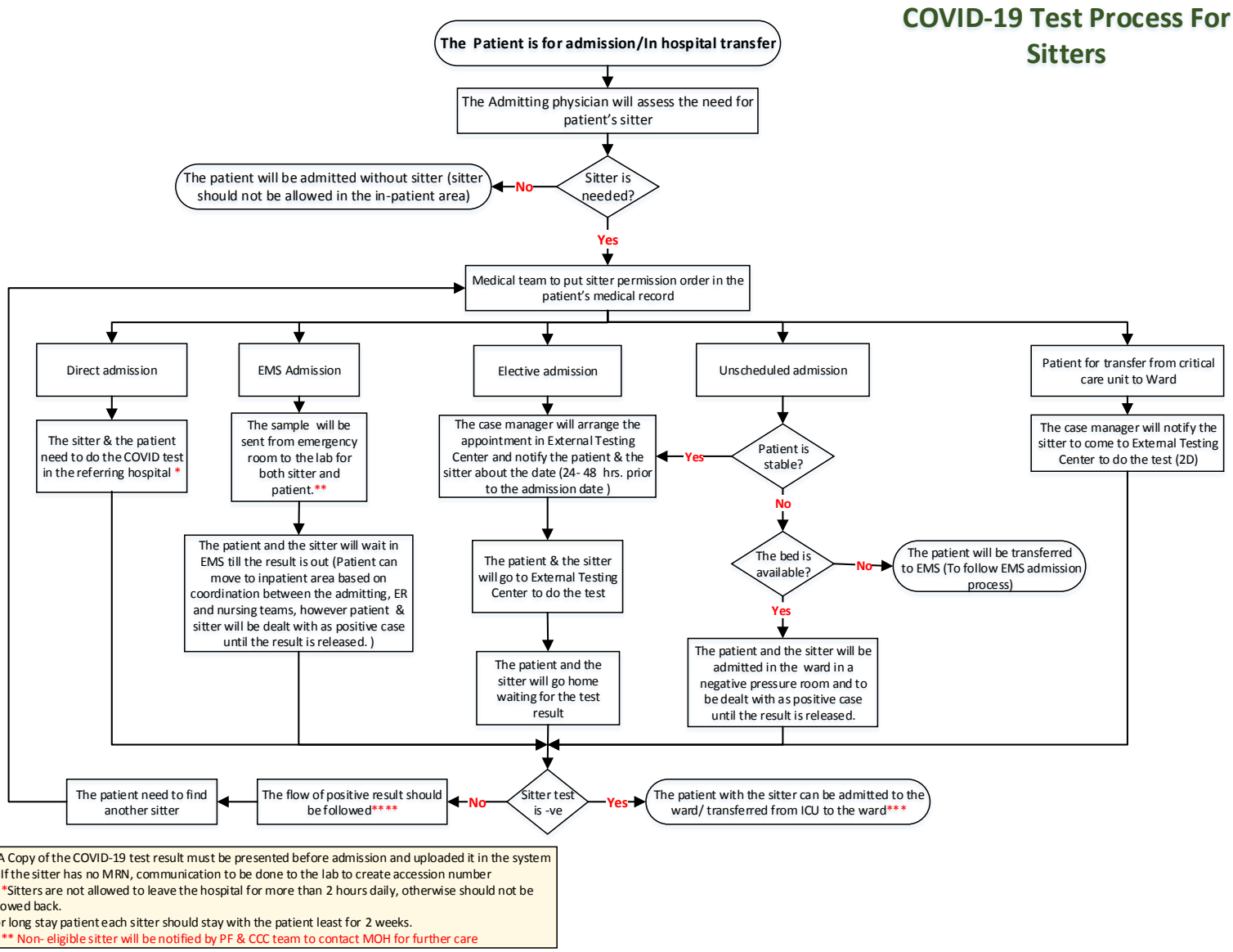
1.1 All patients presenting to ED with high likelihood of COVID-19 infection should have a COVID-19 Test done / follow KFSHRC policy for COVID-19 testing.

1.2 If intubation is needed, call COVID-19 assigned anesthesia provider.

1.3 Consider placing all lines (CVC, Arterial catheter) with the intubation process



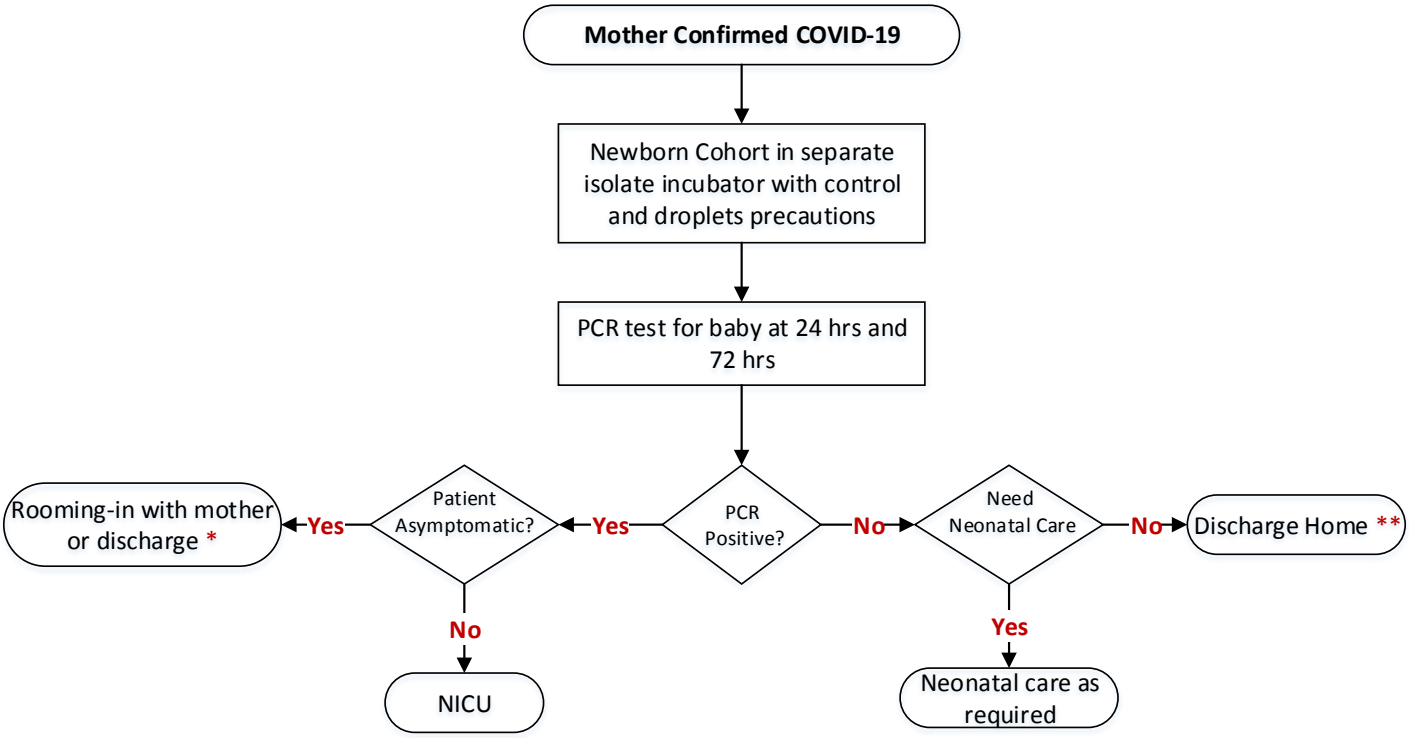
2. COVID-19 test Process for Sitter



* A Copy of the COVID-19 test result must be presented before admission and uploaded it in the system
**If the sitter has no MRN, communication to be done to the lab to create accession number
***Sitters are not allowed to leave the hospital for more than 2 hours daily, otherwise should not be allowed back.
For long stay patient each sitter should stay with the patient least for 2 weeks.
**** Non- eligible sitter will be notified by PF & CCC team to contact MOH for further care

3. Managing Newborn of COVID-19 Mother

Flow Chart for Managing Newborn of COVID-19 Mother

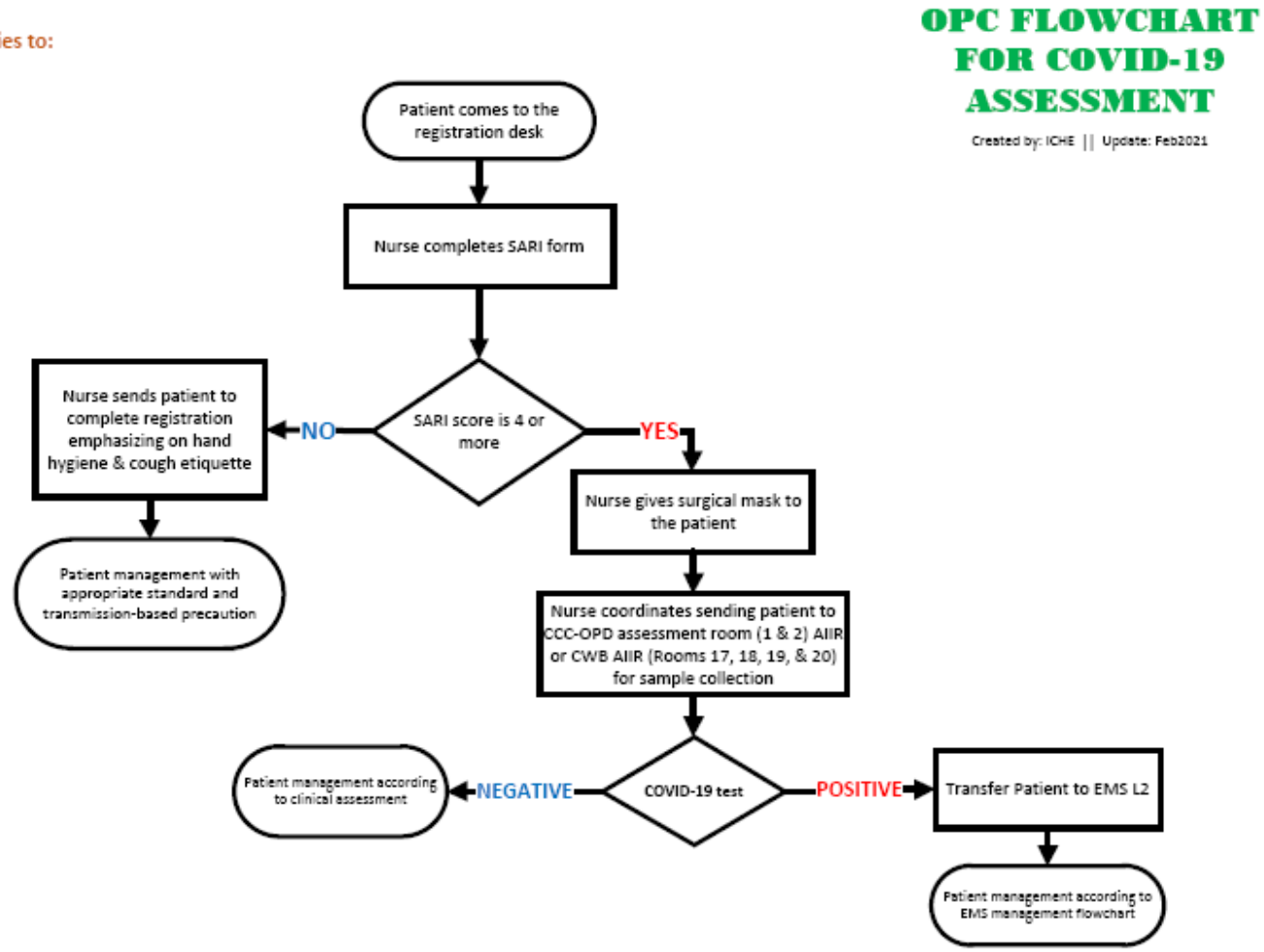


*If infant SARS-CoV-2 testing is positive, but asymptomatic, plan follow-up daily by phone for 10 days after birth. Use precautions to prevent household spread from infant to caregivers.

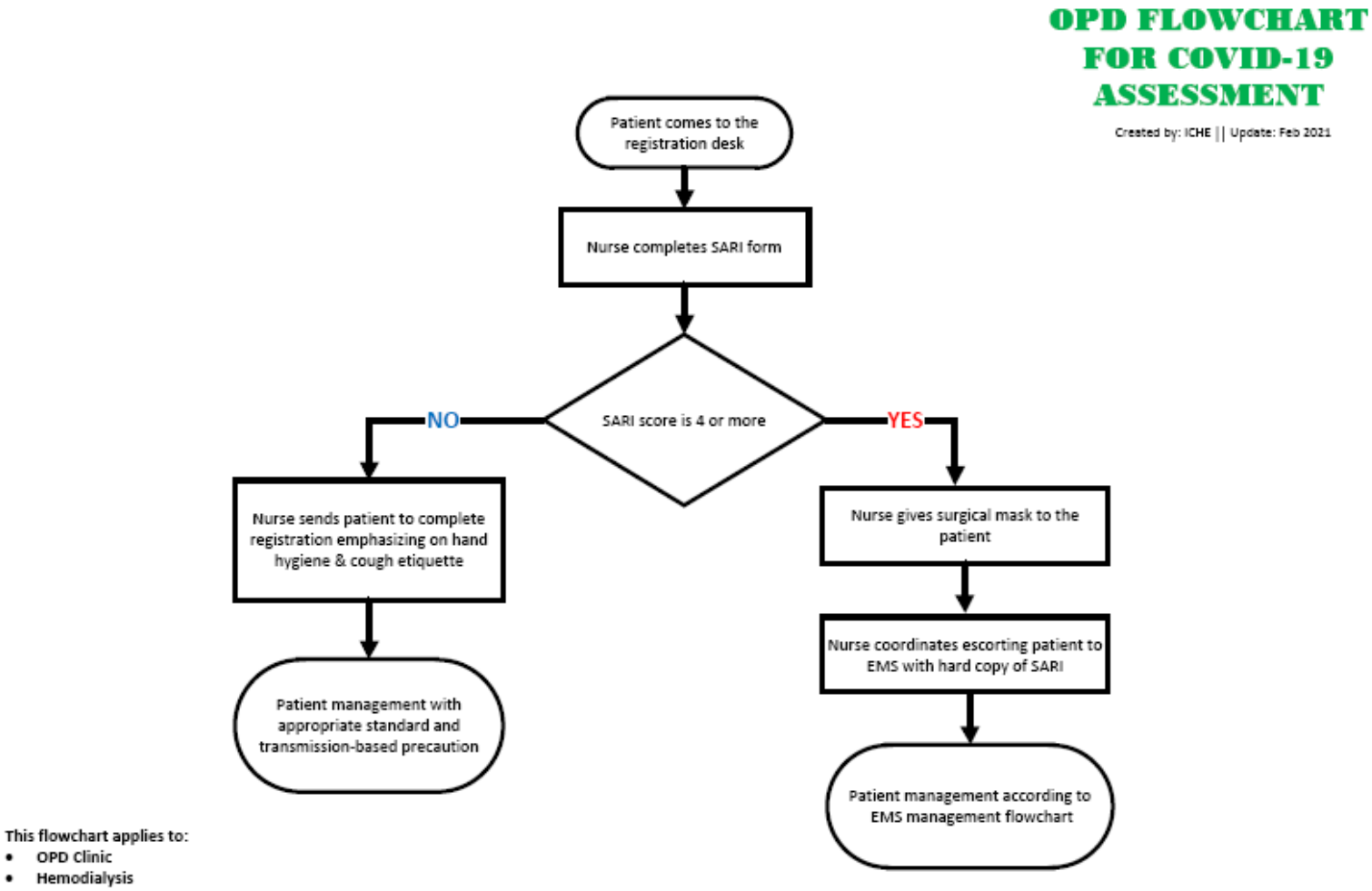
**If infant SARS-CoV-2 testing is negative, considered cleared from COVID-19. Most infants will be discharged to families where other caregivers have been exposed to and may have acquired COVID19 infection. Every effort should be taken to provide infection-prevention education to all caregivers of the infant, which includes not only written education but also verbal education.

4. Outpatient clinic assessment at Children Cancer Centre

This flowchart applies to:
- CCC OPC
- CCC Treatment



5. Outpatient, hemodialysis, infusion center and treatment area assessment

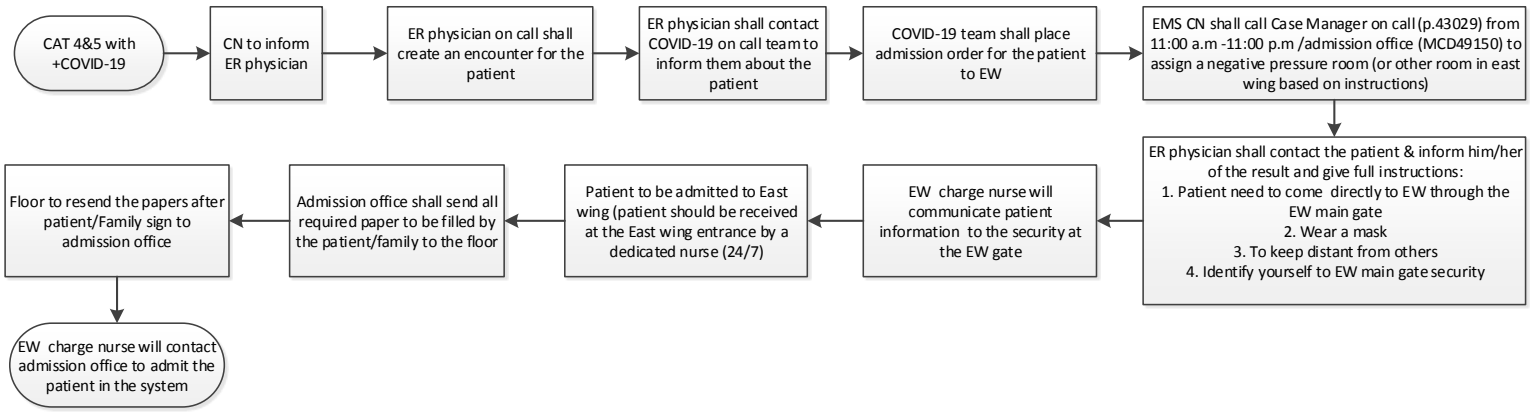


This flowchart applies to:

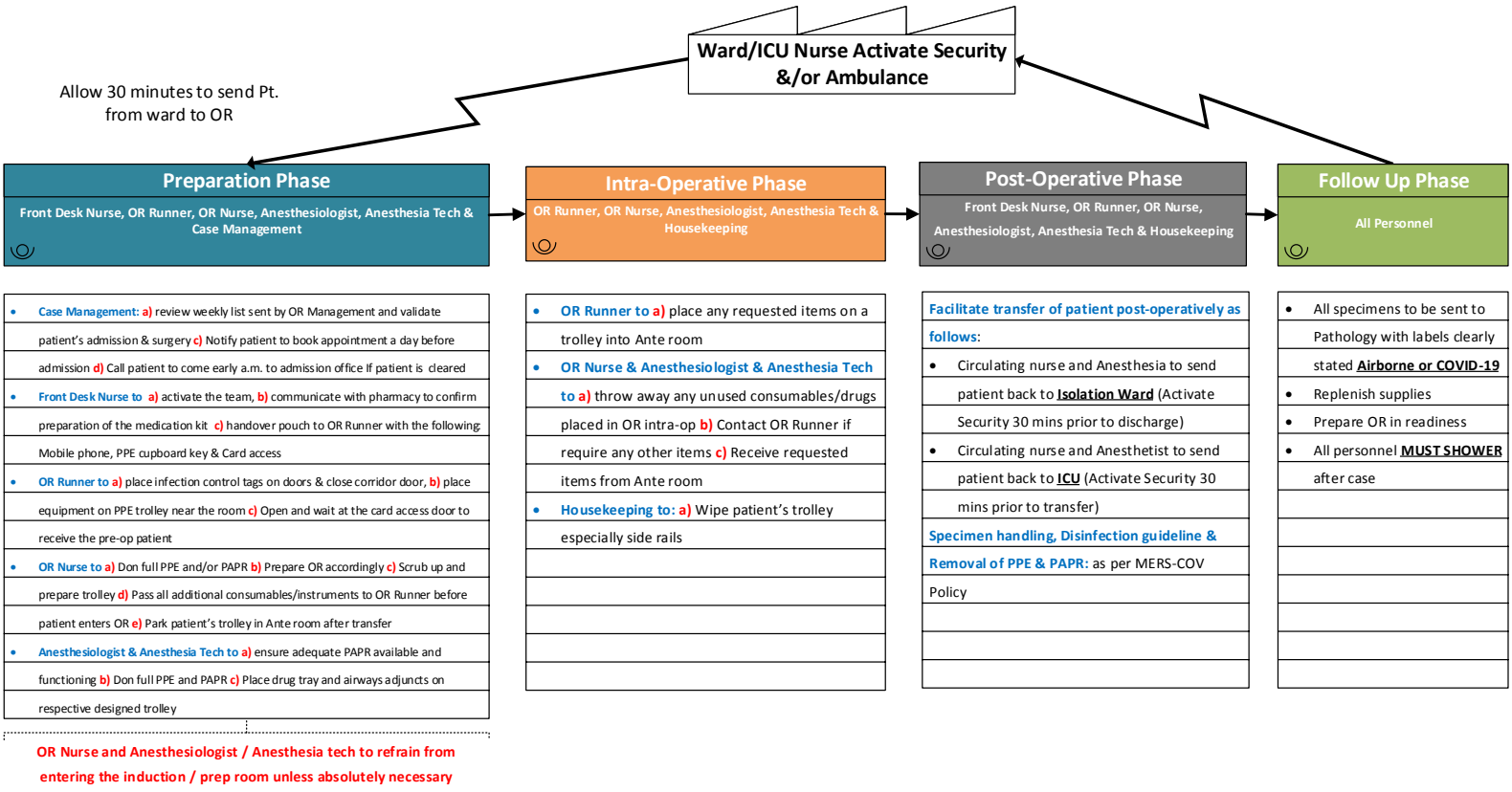
- OPD Clinic
- Hemodialysis
- Infusion Center
- Treatment area

6. Admission flowchart for COVID-19 patient

ADMISSION FLOWCHART FOR COVID-19



7. Activation of OR Process from Isolation wards / ICU for COVID-19 Patient



§ ICU: Intensive Care Unit OR: Operating Room PAPR: Powered Air Purifying Respiratory PC: Personal Computer PPE: Personal Protection Equipment Pre-Op: Preoperative

XVI. Management of Deceased bodies

1. Deceased bodies of COVID-19 patients may pose a risk of infection transmission; transmission-based precautions shall be followed to the deceased COVID-19 cases.
2. The trolley /stretchers carrying the body must be disinfected after transporting the deceased body.
3. Only experienced morgue staff are dealing 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.
4. Prevents relatives from direct surface contact with the body such as touching or kissing it is allowed to view the body bag under strict instructions wearing PPE and observation for compliance.
5. Limit the number of morgue's personnel dealing with the dead body to the minimum number required.
6. All personnel performing or attending the body washing and preparation should wear PPE (surgical mask, face shield, isolation gown, clean gloves and aprons) and should perform hand hygiene after removal of the gloves.
7. If family members wish to perform the body washing, this should be under supervision must strictly adhere to standard precautions and use PP. The family shall wear gloves and gown and perform hand hygiene in the morgue.
8. Body washing of COVID-19 cases are preferably be done at hospitals. However, it can be safely performed in public washing facilities, If the dead body transmitted outside the healthcare facility to be prepared for burial the receiving facility should be informed by the disease, mode of transmission and precautions needed during body preparation, a public health worker is identified to accompany the body in order to ensure compliance with the required precautions throughout the pre-burial period.
9. Neither embalming nor autopsy is performed in the morgue.
10. Notifications
    - 10.1 Upon patient's death, the nurse shall notify the Consultant/Designee and the Head Nurse or designee (during working hours) and Nursing Supervisor (after working hours).
    - 10.2 The nurse shall notify the Morgue/Mortician on-call for any death with suspected or confirmed COVID-19.
    - 10.3 The Consultant/Designee notifies the patient's family.

11. Care of Deceased Body
    - 11.1 Management of deceased body as per: Standard and Transmission-Based Precautions and meticulous hand hygiene shall be performed as per Hand Hygiene Procedure.
    - 11.2 Nursing staff shall notify the morgue if confirmed or suspected of COVID-19 patient, this shall be communicated verbally, as well as to attach the Standard Precaution labels to the body and documented in the Mortuary logbook.
    - 11.3 Use appropriate PPE according to the risk of exposure to bodily fluids.
    - 11.4 For the Adult/Pediatric Deceased body, the Nursing staff shall obtain:
        - 11.4.1 Mortuary impermeable body bag (depending on size of patient).
        - 11.4.2 One cotton shroud/bed sheet.
        - 11.4.3 Two absorbent.
        - 11.4.4 Three identification Standard Precautions tags.
        - 11.4.5 One chin strap.
        - 11.4.6 Three ties (wrists and ankles)
        - 11.4.7 Two long gauze ties.
        - 11.4.8 FOR ALL CASES: Complete three (3) identification tags labeled/stamped with the deceased's identification, subsequently referred to as Identification (ID) Tag #1, #2 and #3.
        - 11.4.9 If applicable, on each ID tag, mark the box if the patient deceased from a (confirmed or suspected) COVID-19.

11.5 Remove gown, and all the tubes from body including Invasive lines and devices (intravenous catheters, endotracheal tubes, nasogastric tubes urinary catheters, electrical impulse devices) are removed and disposed of. DO NOT pack orifices, clean the body of body fluids and tape marks.

11.6 Packed wounds and natural openings with absorbent material and dressed with hermetic dressing to contain body fluids.

11.7 Wrap the body first with a bed sheet, then followed by the provided impermeable bag.

11.8 The body shall be fully sealed in two (2) impermeable body bags (double-bagging) prior to removal from the isolation room/area, and prior to transfer to the morgue.

11.9 Ensure body is completely covered.

11.10 ID Tag #3 shall be sent to the morgue with the deceased, place this tag on the outside of the morgue refrigerator.

11.11 All waste and PPE used to clean the body shall be disposed in yellow biohazard medical waste containers as per the MOH guidelines

11.12 Transfer to the morgue shall occur as soon as possible after death, ensuring completion of required documentation.

11.13 The body shall be fully sealed in an impermeable body bag prior to removal from room/area and prior to transfer to the morgue.

11.14 If impermeable body bag is not available, use double cotton shroud/bed sheet. No leaking of body fluids shall occur; the outside bag must be kept clean.

12. Transport to The Morgue and Handling in The Morgue:

1. All deceased bodies shall be taken to the morgue.
2. Maintain transmission-based precautions.
3. A Nurse/care assistant shall accompany the WC/PCA to the morgue.
4. During working hours, the mortician shall open the Morgue.
   - 4.1. After working hours, the nursing personnel shall call Safety & Security to open the morgue.
   - 4.2. Security personnel shall be physically present at the morgue and shall open the door when the deceased body are delivered.
   - 4.3. At ALL TIMES, the Nurse(s)/Care Assistant shall document in the Mortuary Log Book in the presence of the Morgue staff/Safety & Security shall sign the Mortuary Log Book confirming completion of documentation and placement of deceased body in the corresponding morgue refrigerator drawer.
   - 4.4. All required documents shall be left at the morgue registry.
5. Transport of deceased body:
   - 5.1 Day Shift:
     - 5.1.1 Ward Clerk shall notify Transportation Services and the PCA when a body is ready for transport.
     - 5.1.2 Ambulance Transportation Services shall collect the body.
   - 5.2 Night Shift or Weekends:
     - 5.2.1 Nurse / Ward Clerk shall notify transportation Services when a body is ready for transport.
     - 5.2.2 Ambulance Transportation will collect and transfer the body to the morgue.

XVII. Collection and handling of laboratory specimens from patients with suspected COVID-19

All specimens collected for laboratory investigations should be regarded as potentially infectious.

1. HCWs who collect or transport clinical specimens should adhere to Standard Precautions to minimize the possibility of exposure to pathogens.
2. Ensure that HCWs who collect specimens use appropriate PPE (eye protection, medical mask, long-sleeved gown, gloves).
3. The respiratory specimen should be collected under aerosol generating procedure, personnel should wear a particulate certified N95 respirator.
4. Ensure that all personnel who transport specimens are trained in safe handling practices and spill decontamination procedures.

5. 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.
6. Ensure that health-care facility laboratories adhere to appropriate biosafety practices and transport requirements according to the type of organism being handled.
7. Deliver all specimens by hand whenever possible.
8. DO NOT use pneumatic-tube systems to transport specimens.
9. Notify the laboratory that this is a request for COVID -19 testing.
10. Sample collection and transport

    It is advised that lower respiratory specimens such as sputum, endotracheal aspirate, or bronchoalveolar lavage be used when possible. If patients do not have signs or symptoms of lower respiratory tract infection or lower tract specimens are not possible or clinically indicated, nasopharyngeal specimens should be collected (similar to MERS sample collection).
11. Approach to sampling
    - 11.1 Any patient who meets the screening criteria with appropriate SARI score will be screened for COVID-19.
    - 11.2 The sample will be delivered and tested in the Microbiology Laboratory for COVID-19 and other respiratory pathogens according to the clinical presentation.
    - 11.3 If the sample result came back as positive for COVID-19, the positive sample should be sent to the National Health Lab.
12. Specimen collection techniques and/or requirements
    - 12.1 Specimens for COVID-19 shall be collected on those patients who meets the case definition for a suspected/probable or confirmed case.
    - 12.2 All HCW collecting specimens shall wear appropriate PPE at all time.
    - 12.3 All specimens shall be regarded as potentially infectious.
    - 12.4 All samples shall be collected as per microbiology laboratory guidelines.
    - 12.5 All samples for COVID-19 shall be hand delivered to the KFSH&RC microbiology laboratory.
    - 12.6 The pneumatic tube system shall not be used for this purpose.
    - 12.7 The positive sample shall be sent to the National Laboratory by microbiology.
    - 12.8 Infection Control department staff shall access and complete the electronic Riyadh Regional Laboratory request form for COVID-19 On this link http:84.2235.89..114/RRL .
    - 12.9 Refer to **Appendix 4** for specimen collection techniques.
13. Laboratory Diagnosis

    All staff who will be handling the COVID-19 should be trained for appropriate collection, specimen storage, packaging and transportation. When collecting the specimen avoid contamination. Follow the appropriate precautions for safety during collection and processing of samples.
    - 13.1 At the current time, samples which are positive for COVID-19 will be sent to the National Health Lab (NHL).
    - 13.2 Laboratories should NOT do viral isolation and culture from samples collected from patients suspected of having COVID-19 infection.
14. Storage and Shipment of samples

    Store samples at 2-8°C and ship on ice pack to NHL. 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.
    - 14.1 Samples can be shipped to NHL free of charge via the courier, SMSA, following appropriate regulations.
    - 14.2 All specimens must be appropriately packaged and addressed to the NHL.
    - 14.3 Courier services are provided 7 days a week.

XVIII. References

1. CIPP-640: Hand Hygiene Procedure
2. CIPP-654: Medical Waste Disposal Policy
3. CIPP-671: Standard and Transmission-Based Precautions
4. CIPP-687: Infection Prevention Management of a Suspected Epidemic-Outbreak
5. CIPP-683: Control and Management of Febrile Respiratory Illnesses (FRI)-Severe Acute Respiratory Illness (SARI)
6. CIPP-5110: HIGH-EFFICIENCY PARTICULATE MASK FIT TESTING
7. MOH Guideline 2019 n-CoV
8. https://www.moh.gov.sa/CCC/events/international/Pages/default.aspx
9. Guide to Novel Coronavirus Infection 2019-nCoV, Saudi Center for Disease Prevention & Control
10. https://www.moh.gov.sa/CCC/healthp/regulations/Documents/Interim%20Guide%20to%20Novel%20Coronavirus%20Infection%202019-nCoV.pdf
11. CIPP-964: Care of The Deceased Bodies, Body Parts or Surgical Tissues and Product of Conception (POC)
12. CIPP-707: Middle East Respiratory Syndrome Coronavirus (MERS-CoV).
13. Practice of endoscopy during COVID-19 pandemic: position statements of the Asian Pacific Society for Digestive Endoscopy (APSDE- COVID statements). Gut 2020.
14. Coronavirus (COVID-19) outbreak: what the department of endoscopy should know. GIE 2020.
15. COVID-19 and Endoscopy Services in Intermediately Affected Countries: A Position Statement from the Saudi Gastroenterology Association. SJG 2020.

Appendix 1

Visual Triage Checklist for Acute Respiratory Infection

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 contact with a confirmed case of COVID-19 or MERS-CoV in the last 14 days prior to symptom onset. **OR** An exposure to camel or camel's products (direct or indirect*) in the last 14 days prior to symptom onset. **OR** Lived in or worked in a facility known to be experiencing an outbreak of COVID-19 in the last 14 days prior to symptom onset.	**3**	
B. Clinical Signs and Symptoms	***Pediatric*** (≤14 years)	***Adult*** (>14 years)
1. Fever or recent history of fever. *Note: within the last 72 hours (3 days)*	**4**	**4**
2. Cough (new or worsening). *Note: within the last 72 hours (3 days)*	**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: _____

وزارة الصحة
Ministry of Health

وقاية
Weqaya
المركز الوطني للوقاية من الأمراض ومكافحتها
Saudi Center for Disease Prevention and Control

Appendix 2

Recommendations for Application of Standard Precautions for the Care of All Patients in All Healthcare Settings

COMPONENT	RECOMMENDATIONS
Hand hygiene	After touching blood, body fluids, secretions, excretions, contaminated items; immediately after removing gloves; between patient contacts.
Gloves	For touching blood, body fluids, secretions, excretions, contaminated items; for touching mucous membranes and non-intact skin
Gown	During procedures and patient-care activities when contact of clothing/exposed skin with blood/body fluids, secretions, and excretions is anticipated
Mask, eye protection (goggles), face shield*	During procedures and patient-care activities likely to generate splashes or sprays of blood, body fluids, secretions, especially suctioning, endotracheal intubation
Soiled patient-care equipment	Handle in a manner that prevents transfer of microorganisms to others and to the environment; wear gloves if visibly contaminated; perform hand hygiene
Environmental control	Develop procedures for routine care, cleaning, and disinfection of environmental surfaces, especially frequently touched surfaces in patient- care areas.
Textiles and laundry	Handle in a manner that prevents transfer of microorganism to others and to the environment
Needles and other sharps	Do not recap, bend, break, or hand-manipulate used needles; if recapping is required, use a one-handed scoop technique only; use safety features when available; place used sharps in puncture-resistant container
Patient resuscitation	Use mouthpiece, resuscitation bag, other ventilation devices to prevent contact with mouth and oral secretions
Patient placement	Prioritize for single-patient room if patient is at increased risk of transmission, is likely to contaminate the environment, does not maintain appropriate hygiene, or is at increased risk of acquiring infection or developing adverse outcome following infection
Respiratory hygiene/cough etiquette (source containment of infectious respiratory secretions in symptomatic patients, beginning at initial point of encounter e.g., triage and reception areas in emergency departments and physician offices)	Instruct symptomatic persons to cover mouth/nose when sneezing/coughing; use tissues and dispose in no-touch receptacle; observe hand hygiene after soiling of hands with respiratory secretions; wear surgical mask if tolerated or maintain spatial separation, >3 feet if possible.

Appendix 3

Table 1: Classification of GI endoscopic procedures during COVID-19 outbreak

Category of cases	Action	Examples
Emergency/Urgent Cases	To be performed within 24-48 hours	1. Active gastrointestinal bleeding. 2. Foreign body impaction. 3. Ascending cholangitis. 4. Gastric leak or biliary leak. 5. Volvulus. 6. Obstruction requiring urgent stenting. 7. EUS -guided drainage of symptomatic or infected pancreatic fluid collections.
Semi-urgent Cases	To be performed within 8 weeks	1. All diagnostic endoscopies for alarming features or suspected neoplasms such as: - Dysphagia - Weight loss - Positive FOBT - Iron deficiency anemia - Rectal bleeding - Mass on imaging 2. Symptomatic IBD patients, if procedure will change their management. 3. PEG tube insertion. 4. Investigation of severe abdominal pain. 5. Luminal stent removal/ exchange.
Elective Cases	Deferred until further notice/ Reschedule after 8 weeks	1. All screening/surveillance endoscopy. 2. Diagnostic procedures without alarming symptoms. 3. Manometry and PH study. 4. Capsule endoscopy. 5. Achalasia endoscopic procedures.

Table 2: Classification of bronchoscopy procedures during Covid-19 outbreak

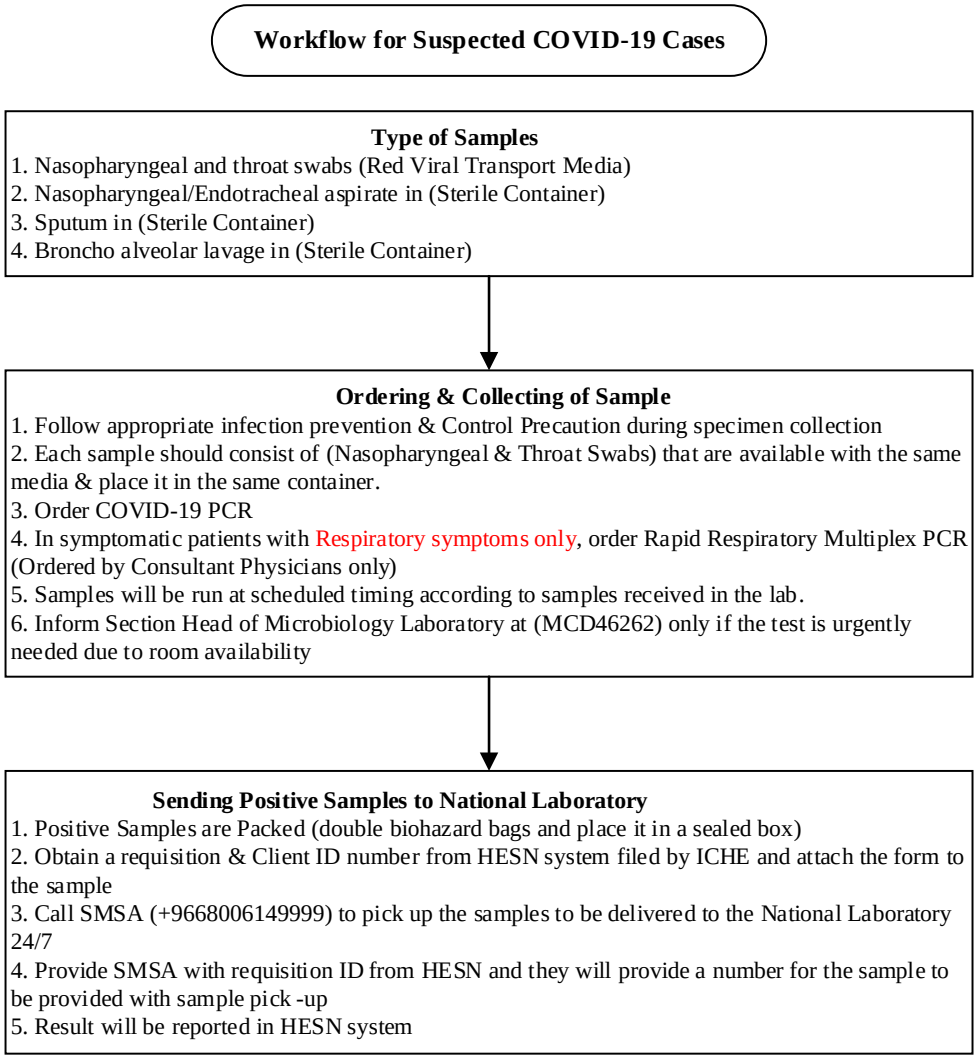
Emergent Bronchoscopy	Urgent Bronchoscopy	Non-Urgent Bronchoscopy
Severe or moderate symptomatic tracheal or bronchial stenosis	Ling mass suspicious of malignancy	Mild tracheal or bronchial stenosis
Symptomatic central airway obstruction (airway mass or mucus plug)	Mediastinal or hilar adenopathy suspicious for cancer	Clearance of secretion or mucus plugging
Massive haemoptysis	Whole lung lavage	High suspicion of sarcoidosis with no immediate need to start therapy
Migrated stent	Foreign body aspiration	Chronic interstitial lung disease
	Mild to moderate haemoptysis	Detection of chronic infection (e.g. NTM)
	Suspected pulmonary infection in immunocompromised patients	Chronic cough
		Tracheobronchomalacia evaluation

Table 3: Type of endoscopy procedures in relation to the use of PPE

	Enhanced PPE for high risk/ confirmed COVID-19	Standard PPE for non- suspected/ test negative cases
EGD ERCP Colonoscopy	N95 Water resistant gown Double gloves Goggles/face shield Hair net/surgical cap Shoe cover Negative pressure room	Surgical mask Isolation gown Gloves Goggles/face shield Standard /negative pressure room
Bronchoscopy	N95 Water resistant gown Double gloves Goggles/face shield Hair net/surgical cap Shoe cover Negative pressure room	N95/Surgical mask Isolation gown Gloves Goggles/face shield Negative pressure room

Appendix 4

Specimen collection techniques for suspected COVID-19 Cases



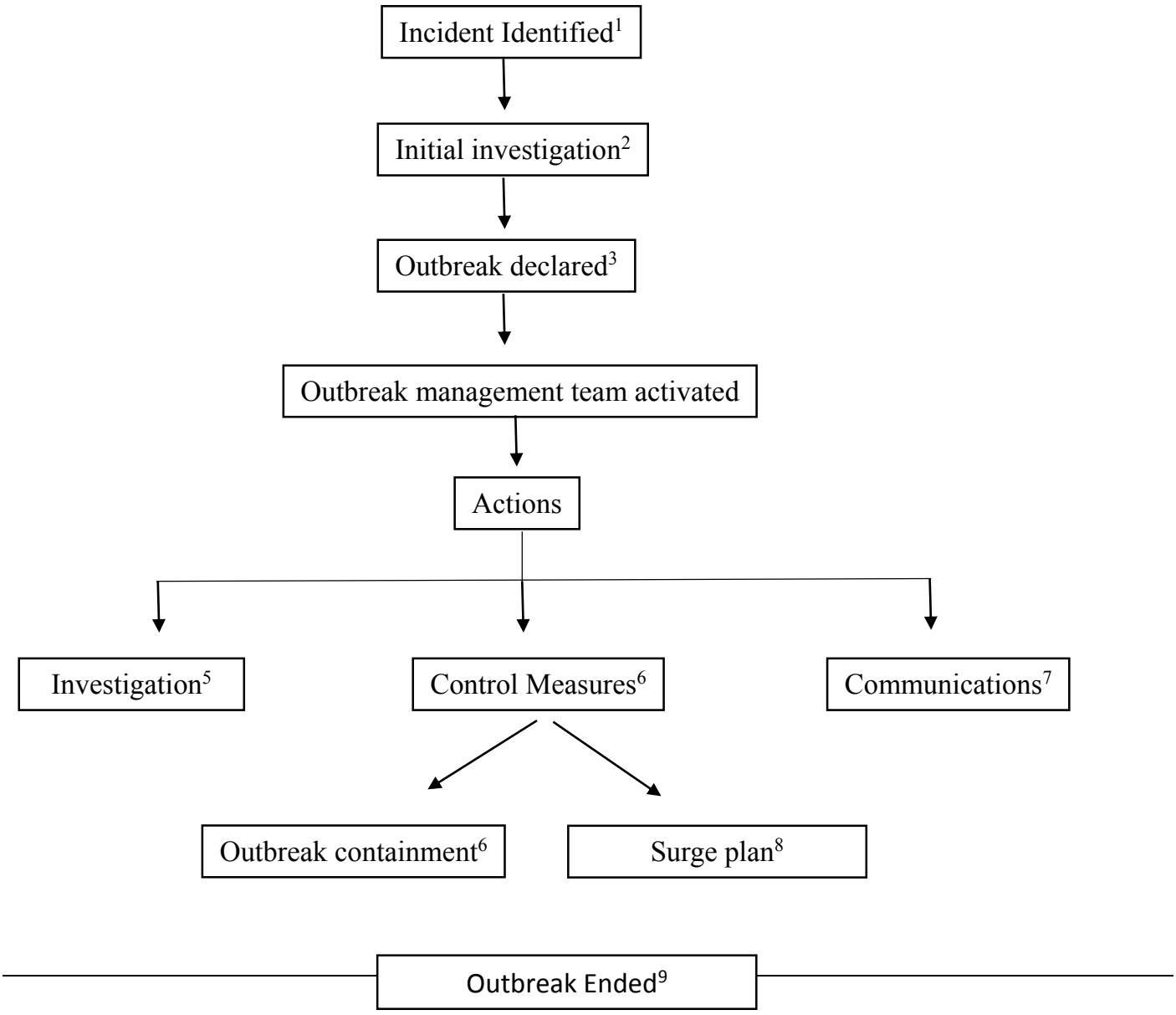
Appendix 5

Exposure management for COVID-19

Epidemiologic risk factors	Exposure category	Recommended Monitoring for COVID-19 (until 14 days after last potential exposure)	Work Restrictions for Asymptomatic HCP
Prolonged close contact with a COVID-19 patient who was wearing a facemask (i.e., no source control)			
HCP PPE: None HCP exposed to patients fluids without appropriate protection (e.g. splash to mucus membrane) HCP PPE: Not wearing a facemask or respirator	Low	Active	• Initial testing after 24 hours from the last day of exposure • HCW can continue to work Self-monitoring daily for 14 days for any signs and symptoms
HCP PPE: Not wearing gown or gloves HCP PPE: Not wearing eye protection HCP PPE: Wearing all recommended PPE (except wearing a facemask instead of a respirator) HCP PPE: Protected	No Risk	Self with delegated supervision	No action required, testing is not recommended and you can continue your work.
Prolonged close contact with a COVID-19 patient who was NOT wearing a facemask (i.e., source control)			
HCP PPE: None HCP PPE: Not wearing a facemask or respirator	High	Active	Exclude from work for 5 days after last exposure. Final testing at day 5 from last exposure
HCP PPE: Not wearing eye protection with AGPs	Low		Self-monitoring daily for 14 days for any signs and symptoms Initial testing after 24 hours from the last day of exposure HCW can continue to work
HCP PPE: Not wearing gown or gloves : Not wearing eye protection with NO AGPs HCP PPE: Wearing all recommended PPE (except wearing a facemask instead of a respirator) HCP PPE: Protected with complete PPE	No Risk	Self with delegated supervision	No action required, testing is not recommended and you can continue your work.

Appendix 6

Outbreak Management Flowchart



1. Identified as per definition of healthcare facility outbreak
2. Confirm definition of an outbreak by the COVID-19 CCC
3. Confirm outbreak by the COVID-19 CCC
4. Investigation to clarify the nature of the outbreak is primarily done by ICHE. This should be started immediately upon identification of the outbreak and results are discussed in the daily meeting of the outbreak management team.
5. Control measures include all actions that will lead to containment of the outbreak and eventual end.
    a. Identifying and closing all gaps in infection prevention and control measures
    b. Environmental cleaning and disinfection

c. Contact tracing, testing, and management
d. Patient flow and restrictions
e. Units restrictions or closure
f. Implementation of surge plan in case of increase in the size of the outbreak
g. Health education for contacts of the disease symptoms, transmission, and isolation.
h. Contacts not to report to work.

6. Communication with the public is coordinated by the communication platform of the COVID-19 CCC.
7. Surge plan as outlined above.

Appendix 7

Spacing of Patients

The minimum distance that should be maintained between patients' beds in selected clinical units as recommended by the Ministry of Health (MOH), the American Institute of Architects (AIA) Academy of Architecture for Health (1), and the International Federation of Infection Control (IFIC) (2).

Unit	Distance between beds recommended by:		
	MoH	AIA	IFIC*
General Ward	A minimum of 1.2 meters between beds	A minimum of 1.22 meters (4 feet) between beds. Minimum of 9.29 square meters (100 square feet) of clear floor per bed.	Basic: 1 meter. Standard: 2 meters. Ideal: 2 meters.
Critical Care Unit	A minimum of 2.4 meters between beds	Minimum 2.44 meters (8 feet) between beds for both pediatric and adult ICUs Minimum of 18.58 square meter (200 square feet) of clear floor area per bed.	Basic: 1.5 meters. Standard: 2 meters. Ideal: 2 meters.
Hemodialysis Unit	A minimum of 1.2 meters between beds	A minimum of 1.22 meters (4 feet) between beds and/or lounge chairs A minimum 7.43 square meters (80 square feet) of clear floor area per patient cubicle.	No recommendation published.
Emergency Unit	A minimum of 1.2 meters between beds	A minimum of 1.22 meters (4 feet) between beds/stretchers A minimum 7.43 square meters (80 square feet) of clear floor area per patient cubicle.	Standard: 1.5 meters. Ideal: 2 meters.

*IFIC recommendations are given in three levels:
- Basic – Even with severely limited resources, this is what you should do as a minimum.
- Standard – this is what you should aim for in less wealthy countries.
- Ideal – if you have the resources, this is what you could do.

1. The American Institute of Architects Academy of Architecture for Health. Health and Human Services Guidelines for Design and Construction of Hospital and Healthcare Facilities, 2001 Edition.
2. Walter Popp, Peter Hoffman, Judene Bartley. The design of a general ward (Version 3). International Federation of Infection Control (IFIC) Construction, Design and Renovation Interest Group. 1 February 2010: page 1. Available at: http://www.theific.org/pdf_files/SIGs/recommendation_design_of_ward.pd

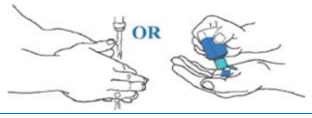
Appendix 8

Donning on PPE for AGPs

COVID-19: Sequence for Putting on (Donning) Personal Protective Equipment (PPE) for Aerosol Generating Procedures (AGPs)

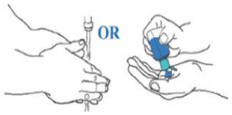
***Run donning checklist to yourself before entering the area**
***Ensure you are cross-checked by a colleague after donning your PPE**

1. Perform hand hygiene



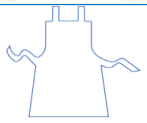
2. Shoe cover

3. Perform hand hygiene



4. Gown
Don the long-sleeves fluid repellent disposable gown.
Gown to fully cover torso from neck to knees, arms to end of wrist and wrap around the back and fastened at the back

5. Apron



6. Respiratory (fit-tested, seal-checked N95 mask) or PAPR (Powered Air Purifying Respirator)

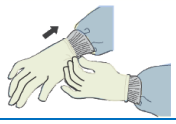
- Hold the mask with your right hand, please it on your cover to cover your mouth and nose
- Secure ties or elastic bands at middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Seal-check respirator

7. Head cover

8. Googles or Face Shield

- Position googles over your eyes and secure to the head using the earpieces
- Position face shield over your face and secure on the brow with headband
- Adjust to fit comfortably

9. Gloves
Select the gloves according to your hand size. Ensure the cuff of your gown is covered by the cuff of the glove.



Infection Control: How to Safely Use PPE

- Keep gloved hand away from face • Avoid touching or adjusting other PPE • Remove gloves if they become torn
- Hand hygiene before donning new gloves • Limit surfaces and items touched

Appendix 9

Doffing on PPE for AGPs

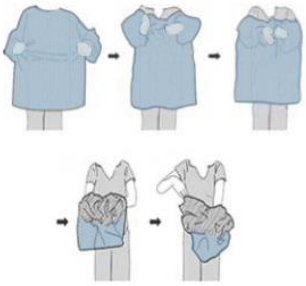
COVID-19: Sequence for Removing (Doffing) on Personal Protective Equipment (PPE) for Aerosol Generating Procedures (AGPs)

All PPE should be removed at your doorway except respirator. Remove the respirator after leaving patient room and after the closing door.

PPE should be removed in an order that minimize the potential for cross contamination.

10. Gown and gloves

- Gown front and sleeves and the outside of gloves are contaminated!
- Grasp the gown in the front and pull away from your body so that the ties break, touching outside of gown only with gloves hands.
- While removing the gown, fold or roll the gown inside-out into a bundle
- As you are removing the gown, peel off your gloves at the same time, only touching the inside of the gloves and gown with your bare hands. Place the gown and gloves into a waste container.
- If your hands get contaminated during gown or glove removal, immediately wash your hands or use an alcohol-based hand sanitizer.

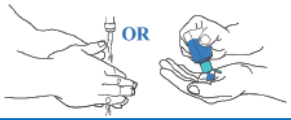


11. Goggles or face shield

- Outside of goggles or face shields are contaminated!
- Remove goggles or face shield from the back by lifting headband and without touching the front of the goggles or face shield and then discard in a waste container.
- If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer.

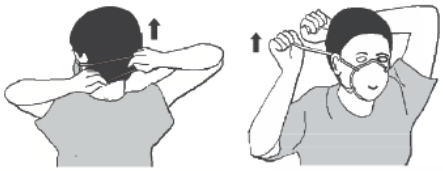
12. Remove your head cover and shoe cover

13. Perform hand hygiene

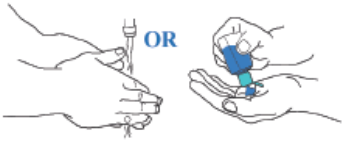


14. Remove your Respirator (Fitted N95 mask)

- Front of respirator is contaminated – DO NOT TOUCH!
- Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front.
- Disc in a waste container (follow your hospital policy)
- If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer



15. Perform hand hygiene



Appendix 10

Donning and Doffing PPE

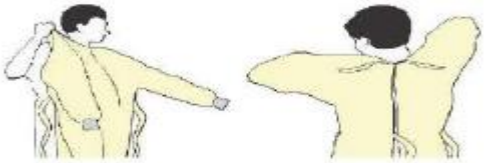
Sequence on Putting Personal Protective Equipment (PPE)

The type of PPE used will vary based in the level of precautions required, such as standard, contact droplet, or airborne. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

16. PERFORM HAND HYGIENE

17. GOWN

- Fully cover torso from neck and knees, arms to end of wrists, and wrap around the back
- Fasten in back of neck and waist



18. MASK OR RESPIRATOR

- Secure ties or elastic bands at middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Fit-check respirator

19. GOGGLES OR FACE SHIELD

- Place over face and eyes and adjust to fit

20. GLOVES

- Pull the gloves to cover the wrist of the isolation gown

USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD PF CONTAMINATION

- Perform hand hygiene
- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn heavily contaminated

How to Safely Remove Personal Protective Equipment (PPE)

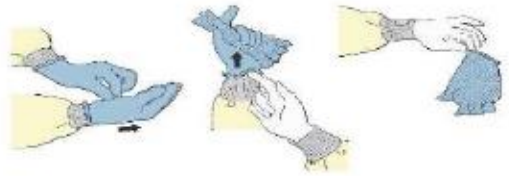
There are a variety of ways to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials

NOTE:

4 Remove all PPE before existing the patient room except a respirator, if worn.
5 Remove the respiratory after leaving the patient room and closing the door.
6 If hands become visibly contaminated during PPE removal, wash hands before continuing to remove the remaining PPE

REMOVE PPE IN THE FOLLOWING SEQUENCE:

1. **GLOVES**
   - Grasp outside edge near wrist
   - Peel away from hand, turning glove inside-out
   - Hold in opposite gloved hand
   - Slide ungloved finger under the wrist of the remaining glove
   - Peel off from inside, creating a bag for both gloves
   - Discard into waste container



2. **PERFORM HAND HYGIENE**

3. **REMOVE GOGGLES OR FACE SHIELD**
   - Grasp ear or head places with ungloved hands
   - Lift away from face
   - Place in designated receptacle for reprocessing or disposal
   - Discard into waste container

4. **REMOVING ISOLATION GOWN**
   - Unfasten ties
   - Peel gown away from neck and shoulders
   - Turn contaminated outside toward the inside
   - Fold or roll into a bundle
   - Discard into waste container

5. **REMOVING MASK OR RESPIRATOR**
   - Font of the mask/respirator is contaminated – DO NOT TOUCH
   - Grasp bottom, than top ties or elastics and remove
   - Discard in a waste container

6. **IMMEDIATELY AFTER REMOVING ALL PPE WASH HANDS OR USE AN ALCOHOL–BASED HAND SANITIZER**

PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATEL AFTER REMOVING ALL PPE

Appendix 11

Nursing Surge Plan-COVID-19 Hemodialysis

Nursing Surge Plan – COVID 19 Hemodialysis Unit

8th April 2020

Phase A

- **Normal working capacity**

Phase B

1. Cross train staff and provide refreshers for staff within the Peritoneal Dialysis Service.
2. Utilize staff from the Dialysis Access Suite to dialysis patients.
3. Clinical Nurse Coordinators take a patient cohort.
4. Provide each area with a zonal area of nurses i.e. KACOLD, Main Hospital, EMS and Isolation Wing for COVID-19 patients. This is to reduce exposure and potential spread to patients and staff.
5. Critical care nurses are responsible for CRRT across the Intensive Cares (except Heart Centre) to reduce work time for Dialysis Nurses and reduce exposure risk for staff.

Phase C - Point 1 of our current situation

1. Identify staff within the organization that has Hemodialysis experience and can transfer and up skill with the current 6008 machines to prepare for the surge.
2. Temporarily accepted patients need to be referred onto centers medically to release this nursing cohort into the numbers to deal with the surge for when it comes.
3. Maintain as many patients on PD if stable rather than transferring to HD where clinically and medically safe.
4. Increase Home Hemodialysis numbers – further funding will be required. 4 suitable additional candidates.

Phase D

1. Shorten dialysis session to 3hrs/per session (reducing the dialysis time by 1 hour) so we can introduce a third shift to deal with either a short staff supply or to dialysis only COVID-19 positive patients during this period.
   East Wing has only 15 ports so an alternative location will need to be identified – possibly the old Hemodialysis Unit.
2. Disaster management type measures need to be implemented medically to ensure that the responsibility of caring for these patients is shared equally across all regions.
3. Chronic Unit will close and chronic patients will be referred to other centers.

Appendix 12

Guidance on optimizing the supply of personal protective equipment (PPE)and the use of PPE when in short supply

Due to the COVID-19 pandemic, high consumption of PPE worldwide may result in an acute shortage of PPE supplies. In order to meet the demand, alternative measures may be needed to optimize the supply of PPE that based on scientific evidence, the principles of safe care delivery and more importantly health-care worker safety, in addition to workload minimization for health care workers, and avoiding a false sense of security. These measures are strictly on temporary basis during periods of PPE shortages.

Purpose and scope

This document aims to describe two approaches to PPE use optimization: Extended Use and Reuse of PPE.

General Measures:

1. limit contact of patients to urgent or emergency situations.
2. Maximizing the use of telemedicine
3. limit the admission of COVID-19 to symptomatic patients only if possible.
4. Reduce the number of patients going to the hospital or outpatient settings
5. Reduce face-to-face HCP encounters with patients

Definitions:

Extended use: refers to the practice of wearing the same N95 respirator for repeated close contact encounters with several patients, without removing the respirator between patient encounters. Extended use may be implemented when multiple patients are infected with the same respiratory pathogen and patients are placed together in dedicated waiting rooms or hospital wards. Extended use has been recommended as an option for conserving respirators during previous respiratory pathogen outbreaks and pandemics. Entails the use of PPE by one health-care worker during one shift for no longer than 6 hours.

Reuse: refers to the practice of using the same N95 respirator for multiple encounters with patients but removing it ('doffing') after each encounter. The respirator is stored in between encounters to be put on again ('donned') prior to the next encounter with a patient. For pathogens in which contact transmission (e.g., fomites) is not a concern, non-emergency reuse has been practiced for decades. For example, for tuberculosis prevention, CDC recommends that a respirator classified as disposable can be reused by the same worker as long as it remains functional[2] and is used in accordance with local infection control procedures.(9) Even when N95 respirator reuse is practiced or recommended, restrictions are in place which limit the number of times the same FFR is reused. Thus, N95 respirator reuse is often referred to as "limited reuse". Limited reuse has been recommended and widely used as an option for conserving respirators during previous respiratory pathogen outbreaks and pandemics. May be reused up to 5 times using the procedures detailed below.

- EXTENDED USE IS PREFERRED OVER RE-USE
- ALWAYS USE PROPER HAND HYGIENE AND DON AND DOFF TECHNIQUE (Attached below)

TYPE OF PPE	MEASURE	DESCRIPTION	PRECAUTIONS AND REMOVAL CRITERIA
Medical/Surgical mask	1) Extended use	The use without removing for up to 6h, when caring for a cohort of COVID-19 patients	• Follow the safe procedure for removal and do not touch the front of the mask (Attached) • The mask needs to be changed whenever providing care outside a designated cohort of COVID-19 patients • If the mask becomes wet, soiled, or damaged, or if it becomes difficult to breathe through • If the mask is exposed to splash of chemicals, infectious substances, or body fluids • If the mask is displaced from face for any reason. • If the front of the mask is touched to adjust it • Use of the same medical mask by a health care worker between a patient with COVID-19 and a patient who does not have COVID-19 is not allowed owing to the risk of transmission to another patient who would be susceptible to COVID-19
	2) Re-use	Not recommended	
Respirators (FFP2, FFP3 or N95)	1) Extended Use	Wearing the same N95 mask to assess different COVID-19 patients without removing the N95 respirator in between but changing yellow isolation gown, gloves and googles or face shield	• Extended use if favored over Reuse • Expected to involve less touching of the respirator • Less risk of contract transmission • The respirator must maintain its fit and function • Use of barriers to prevent droplet spray contamination • Minimize unnecessary contact with the respirator surface • Adhere to strict hand hygiene practices • Properly don and doff personal protective equipment

			• Discard N95 respirators following use during aerosol generating procedures <u>with exception at Old MCO COVID-19 and 2D External Testing Center.These areas and similar testing areas need to adopt the reuse and extended use of N95 respirators approaches.</u> • Discard N95 respirators contaminated with blood, respiratory to nasal secretions, or other body fluids from patients • Discard N95 respirators following close contact with, or exit from,the care area of ant patient infected with an infectious disease requiring contact precautions • Consider use of a face shield or a surgical mask over an N95 respirator and/or other steps (e.g., masking patients) to reduce surface contamination • Perform hand hygiene with soap and water or an alcohol-based hand sanitizer before and after touching or adjusting the respirator • Discard any respirator that is obviously damaged or becomes hard to breathe through
	2) Re-use	Wearing a surgical mask or face shield over the N95 respirator when taking care of the same patient.	• Use of barriers to prevent droplet spray contamination • Discard N95 respirators following use during aerosol generating procedures • Discard N95 respirators contaminated with blood, respiratory or nasal secretions, or other bodily fluids from patients • Discard N95 respirators following close contact with any patient co-infected with an infectious disease requiring contact precautions • Use a face shield or a surgical mask over an N95 respiratory and/or other steps (e.g., masking patients),when feasible to reduce surface contamination of the respirator • Hand used respirator in designated storage area or keep them in a clean,

			breathable container such as a paper bag between uses • Clean hands with soap and water hand sanitizer before and after touching or adjusting the respirator. • Avoid touching the inside of respirator • Use a pair of clean (non-sterile) gloves when donning a used N95 respirator and performing a user seal check • Discard gloves after the N95 respirator is donned to ensure the respirator I sitting comfortably on your face with a good seal • Follow the manufacturer's use instructions, including conducting a user seal check; • Follow the employer's maximum number of donning (or use it for the whole shift) and recommended inspection procedures. • Discard any respirator that is obviously damaged or becomes hard to breathe through • Pack or store respirator between uses so that they do not become damaged or deformed • N95 respirators must only be used by a single wearer • Label container used for storing respirators • Label the respirator itself between uses with the user's name to reduce accidental usage of another person's Respirator
Disposable Gowns used by health workers	1) Extended use	The use without removing, when providing care of a cohort of patients with COVID-19. Not applicable if the patient has multidrug resistant microorganisms or other type of disease requiring contact precautions such as *Clostridioides difficile*. In such case, the gowns should be changed between patients.	Removal criteria and precautions: • If gown becomes wet, soiled, or damaged • If gown is exposed to splash of chemicals, infectious substances, or body fluids • When providing care outside designated cohort of COVID-19 patients • Use of the same gown by a health care worker between a patient with COVID19 and a patient who does not have COVID-19 is not recommended due to the risk of transmission to another patient who would be susceptible to COVID-19

	2) Re-use	Not recommended	
Cloth Gowns used by health workers	1) Extended use	Consideration can be made to extend the use of isolation gowns (cloth) such that the same gown is worn by the same HCP when interacting with more than one patient known to be infected with the same infectious disease when these patients housed in the same location (i.e., COVID-19 patients residing in an isolation cohort). This can be considered only if there are no additional co-infectious diagnoses transmitted by contact (such as *Clostridioides difficile*) among patients. If the gown becomes visibly soiled, it must be removed immediately.	• Cloth gown are reusable after laundering. • Cloth gowns could be considered for reuse without washing if there was minimal to no direct physical contact with the patient or nearby surfaces (wear apron in the top of the reusable cloth gown)
Goggles or safety glasses used by health workers	1) Extended use Extended use of eye protection can be applied to disposable and reusable devices	The use without removing during the shift period, when caring for a cohort of COVID-19 patients.	Removal criteria and precautions: • Eye protection should be removed and reprocessed if it becomes visibly soiled or difficult to see through. • If a disposable face shield is reprocessed, it should be dedicated to one HCW and reprocessed whenever it is visibly soiled or removed (e.g., when leaving the isolation area) prior to putting it back on. • Eye protection should be discarded if damaged (e.g., face shield can no longer fasten securely to the provider, if visibility is obscured and reprocessing does not restore visibility). • HCW should take care not to touch their eye protection. If they touch or adjust their eye protection, they must immediately perform hand hygiene. • HCW should leave patient care area if they need to remove their eye protection.

			• If goggles are contaminated by splash of chemicals, infectious substances, or body fluids • If goggles obstruct health care worker safety or visibility of health care environment or become loose • Use of the same goggles by a health care worker between a patient with COVID19 and a patient who does not have COVID-19 is not recommended due to the risk of transmission to another patient who would be susceptible to COVID-19 **How to Clean Eye Protection Equipment (face shields / goggles)** 1. While wearing gloves, carefully wipe the inside, followed by the outside of the face shield or goggles using a clean cloth saturated with neutral detergent solution or cleaning wipe. 2. Carefully wipe the outside of the face shield or goggles using a wipe or clean cloth saturated with MOH approved hospital disinfectant solution (alcohol wipes / quaternary ammonium compounds). 3. Wipe the outside of face shield or goggles with clean water or alcohol to remove residue. 4. Fully dry (air dry or use clean absorbent towels). 5. Remove gloves and perform hand hygiene.

References:

1. Strategies for Optimizing the Supply of Eye Protection, CDC, Coronavirus Disease 2019 (COVID-19). https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/index.html. https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/eye-protection.html
2. Rational use of personal protective equipment for coronavirus disease (COVID-19) and considerations during severe shortages Interim guidance 6 April 2020. file:///C:/Users/f26654/AppData/Local/Microsoft/Windows/INetCache/IE/0U9VA9TO/WHO-2019-nCov-IPC_PPE_use-2020.3-eng.pdf. https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html
3. How to Reuse PPE, registered nursing, Eye Protection, How to Clean Eye Protection Equipment , https://www.registerednursing.org/how-reuse-ppe/
4. MOH Guidelines