

# Coronavirus Disease (COVID) 2019

## COVID-19 Screening Center Operation Guide

March 4, 2020

The Central Disaster Management Headquarters

The Central Disease Control Headquarters

The Korea Centers for Disease Control and Prevention

# I. Introduction

- ❖ Below are the basic operational guidelines for COVID-19 screening centers. Based on these guidelines, the detailed components (e.g. operating hours, composition of support personnel, etc.) can be adapted by facilities to meet specific needs

## 1. Purpose of Operating a COVID-19 Screening Center

- Prevent spread of disease in healthcare facilities from influx of (suspected) COVID-19 patients or exposed healthcare provider

## 2. Basic Operational Protocols for COVID-19 Screening Center

- 1) Post signage (e.g. banners, posters, etc.) around the COVID-19 Screening Center.
- 2) Stock personal protective equipment (PPE).  
: masks (medical-grade and surgical), face shields (e.g. goggles), disposable long-sleeved gowns, disposable gloves, level D protective equipment, shoe covers, etc.
- 3) All employees participating in the operation of a COVID-19 Screening Center must comply with the appropriate use of PPE and infection prevention measures. For this purpose, provide education and training, and evaluate employees in advance.
- 4) Develop the Operations Team of the COVID-19 Screening Center and allocate roles.

### Example of role division within a COVID-19 Screening Center

| Division                      | Task   |
|-------------------------------|--|
| <b>Patient screening</b>      | <ul style="list-style-type: none"> <li>• Assess the patient's exposure history, signs, and symptoms</li> <li>• When a reportable case is identified, alert the local public health center of suspected case under "Class 1 Infectious Disease: Emerging Infectious Disease Syndrome"</li> </ul>  |
| <b>Screening support</b>      | <ul style="list-style-type: none"> <li>• Produce patient management guidelines, informative posters, and printouts for distribution</li> <li>• Conduct training regarding management of patients with COVID-19 in healthcare facilities</li> <li>• Manage PPE and other supplies (hand sanitizers, etc.) at COVID-19 Screening Centers as well as environmental upkeep, such as cleaning of screening rooms</li> <li>• Manage air quality in COVID-19 Screening Centers</li> </ul> |
| <b>Administrative support</b> | <ul style="list-style-type: none"> <li>• Support management of the reception area in the preliminary examination room</li> <li>• Other miscellaneous administrative support, including staff assignments and work regulations</li> </ul>   |

### 3. Establishing a COVID-19 Screening Center

#### 1) Choosing the location

- External spaces outside emergency rooms or outpatient clinics are recommended. If this is not possible, use a designated section, isolated for the purpose of screening for COVID-19, within a healthcare facility

#### 2) Guiding patients through screening

- Install posters, banners, announcements regarding COVID-19.
  - **Information Center:** at the entrance of a hospital or emergency room
  - **COVID-19 Screening Center:** around the emergency room, etc. (this may change depending on the facility)
- Guide suspected cases to the COVID-19 Screening Center before they enter the emergency room or outpatient clinics. Position guidance personnel as needed.
- Instructions for guiding patients
  - Employees must wear masks (KF94\* or higher grade) and disposable gloves, and guide the patient to the COVID-19 Screening Center from a distance of at least 2 meters
  - Avoid contact with other patient guardians/patients as much as possible

*\* Translators' note: KF94 is equivalent to the N95 mask used in other countries*

#### 3) COVID-19 Screening Center requirements

- Space must be equipped for waiting areas, screening rooms, and temporary isolation areas for patients suspected of having COVID-19.
- If specimens are collected at the facility, appropriate space for specimen collection (isolation room or separate space within COVID-19 Screening Centers) must be available.
- Secure skilled personnel for specimen collection
- Supply masks (surgical, KF94 or equivalent and higher-grade) and hand sanitizer, face shields, disposable gowns, disposable gloves, shoe covers and full body protective clothing.
- Install a basic negative pressure system if possible.

### 4. Visitor inflow Management in COVID-19 Screening Centers

#### 1) Purposes of visitor inflow management

- Prevent spread of disease in healthcare facilities from exposure of healthcare providers or other patients to suspected cases.

#### 2) Principles of visitor inflow management

- i. Separation from other patients and healthcare providers
  - a. Plan designated routes for suspected COVID-19 cases in order to avoid contact with healthcare providers and other patients.
  - b. When transferring a patient, the patient should wear a surgical mask (if patient condition allows, a KF94 or higher-grade also acceptable) and if necessary, a disposable gown, cap, and disposable gloves.
- ii. If negative pressure rooms are available in the healthcare facility, suspected cases should use designated routes (avoiding the Emergency Room as much as possible) to move or be moved

directly to a negative pressure room.

- iii. Use separate COVID-19 screening spaces for suspected COVID-19 cases.
- iv. If a guardian is accompanying a suspected COVID-19 case, the guardian should also wear a medical-grade mask and a long-sleeved gown (with additional PPE as appropriate).

## II. Procedures for Managing (Suspected) Patients at COVID-19 Screening Centers

- **Case classifications for reporting and response**
  - **Confirmed case**  
: A person whose infection with a pathogen has been confirmed in accordance with laboratory criteria, regardless of clinical condition
    - ❖ Diagnostic test: COVID-19 (RT-PCR) test, virus isolation
  - **Suspected case**  
: A person who, after contact with confirmed cases during their symptomatic periods, within 14 days of the contact, develops a fever (37.5°C or higher) or respiratory symptoms (e.g., coughing, shortness of breath, etc.).
  - **Patient Under Investigation (PUI)**
    - 1) A person who, according to a physician's judgment, is suspected of COVID-19 or of pneumonia of unknown etiology
    - 2) A person who develops fever (37.5°C or higher) or respiratory symptoms (e.g., coughing, shortness of breath, etc.) within 14 days of visiting a country with regional spread\* of COVID-19 such as China (including Hong Kong and Macau)  
\* Refer to the WHO website (local transmission)
    - 3) A person with an epidemiological association with a domestic cluster of COVID-19, and who develops a fever (37.5°C or higher) or respiratory symptoms (e.g., coughing, shortness of breath, etc.) within 14 days

### 1. COVID-19 Screening Center Patient Classification

- Through patient information verification, clinical symptoms and signs, and (if necessary) examinations, **patients are classified** according to **case classifications**.
  - **Using the information on the insurance enrollment verification/DUR/ITS**, the **receptionist will ask questions or the doctor will take history** to assess **travel history** and **contact history with confirmed cases** (See Attachment 1)
  - Check if a patient currently exhibits **fever (over 37.5 °C) or respiratory symptoms (cough, shortness of breath/difficulty breathing, etc.)**
  - According to a physician's judgment, examine whether a person is suspected of **COVID-19** or **pneumonia of unknown etiology**
  - Check whether there is an **epidemiological association with domestic cluster**

| Division              | Case classifications   |
|-----------------------|--|
| <b>Suspected case</b> | A person who, after contact with confirmed cases during their symptomatic periods, within 14 days of the contact, develops a fever (37.5°C or higher) or respiratory symptoms (e.g., coughing, shortness of breath, etc.). |

|  |   |
|--|---|
| <p><b>Person Under Investigation (PUI)</b></p> | <p>① A person who, according to a physician's judgment, is suspected of COVID-19 or of <u>pneumonia of unknown etiology</u></p> <p>② A person who develops fever (37.5°C or higher) or respiratory symptoms (e.g., coughing, shortness of breath, etc.) within 14 days of visiting a <u>country with regional spread</u>* of COVID-19 such as China (including Hong Kong and Macau)</p> <p>* Refer to the WHO website (local transmission)</p> <p>③ A person with an <u>epidemiological association with a domestic cluster</u> of COVID-19, and who develops a fever (37.5°C or higher) or respiratory symptoms (e.g., coughing, shortness of breath, etc.) within 14 days</p> |
|--|---|

- 2) If a person corresponds to the above case definitions, guide him/her to a COVID-19 Screening Center. If not, guide them to general care (emergency room, outpatient clinic, etc.) if necessary.

\* (Suspected) patient classification and infection control in case of isolation

- (Suspected) **patients**: Wear a surgical-grade mask (KF94\* or higher if the patient has no difficulty breathing and the condition permits)
- **Reception**: Wear a medical-grade mask (KF94 or higher), disposable gloves, etc.

\* *Translators' note: KF94 is equivalent to the N95 mask used in other countries*

## 2. Response Procedures According to Case Classification<sup>1</sup>

- 1) Response procedures for suspected cases
  - i. **Patient relocation**: Move suspected case to an isolated area or (if there is no isolated area) an separate area
  - ii. **Testing**: Conduct testing (COVID-19 (PCR) test)
  - iii. **Reporting occurrence**: Report occurrence of Class 1 infectious disease: emerging infectious disease syndrome
  - iv. **Patient isolation**: Depending on high-risk and severity classifications, determine hospital isolation or home isolation (Municipal COVID-19 epidemiological investigator or Municipal COVID-19 Patient Management Task Force)
    - Inform patient of living rules during home isolation and testing procedures for COVID-19 (Coronavirus Disease 2019 Response Guideline (for local governments), 7th edition (*available as the "COVID Playbook" on our website*), [Form 8](#), [Appendix 3](#), [4](#), [5](#))
    - Refer to Fig. 1 (COVID-19 Screening Center Response Procedures) for measures after testing results

- 2) Response procedures for PUI
  - i. **Patient relocation**: Move PUI to an isolated area or (if there is no isolated area) an separate area
  - ii. **Testing**: Conduct testing (COVID-19 (PCR) test)
  - iii. **Reporting of occurrence**: Report to the local public health center as Class 1 infectious disease: emerging infectious disease syndrome\*

\* Under the Remarks section of the notification form, select "suspected case" and indicate "Patient Under Investigation (PUI)"

<sup>1</sup> Coronavirus Disease 2019 Response Guidelines (For Local Governments) 7th Edition (*aka the COVID Playbook*)

iv. **Health education\***

- Refrain from leaving home, use of public transportation, use of public facilities, and contacting others; wear masks to prevent respiratory transmission and perform hand hygiene; practice respiratory hygiene and etiquette; when visiting healthcare facilities, inform overseas travel history; etc.
  - If symptoms worsen, contact the public health center or 1339
  - Refer to Figure 1 (COVID-19 Screening Center Response Procedures) for measures according to test results
- ❖ Even if the patient tests negative, it is recommended to comply with the above instructions for 14 days from the date of border entrance or date of symptom onset

**Coronavirus Disease 2019: Target population for declaration**

A person whose infection with a pathogen has been confirmed in accordance with laboratory criteria, regardless of clinical condition

A person who has had **contact with a confirmed case** within the last 14 days

A person who has visited a **country with regional spread of COVID-19 such as China (including Hong Kong, Macau)** within the last 14 days

A person with an epidemiological association with domestic cluster of COVID-19 within the last 14 days

+

+

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A person who develops **fever (37.5 °C or higher) or respiratory symptoms (e.g., coughing, shortness of breath, etc.)**

**A person who, according to a physician's judgment, is suspected of COVID-19 or of pneumonia of unknown etiology**

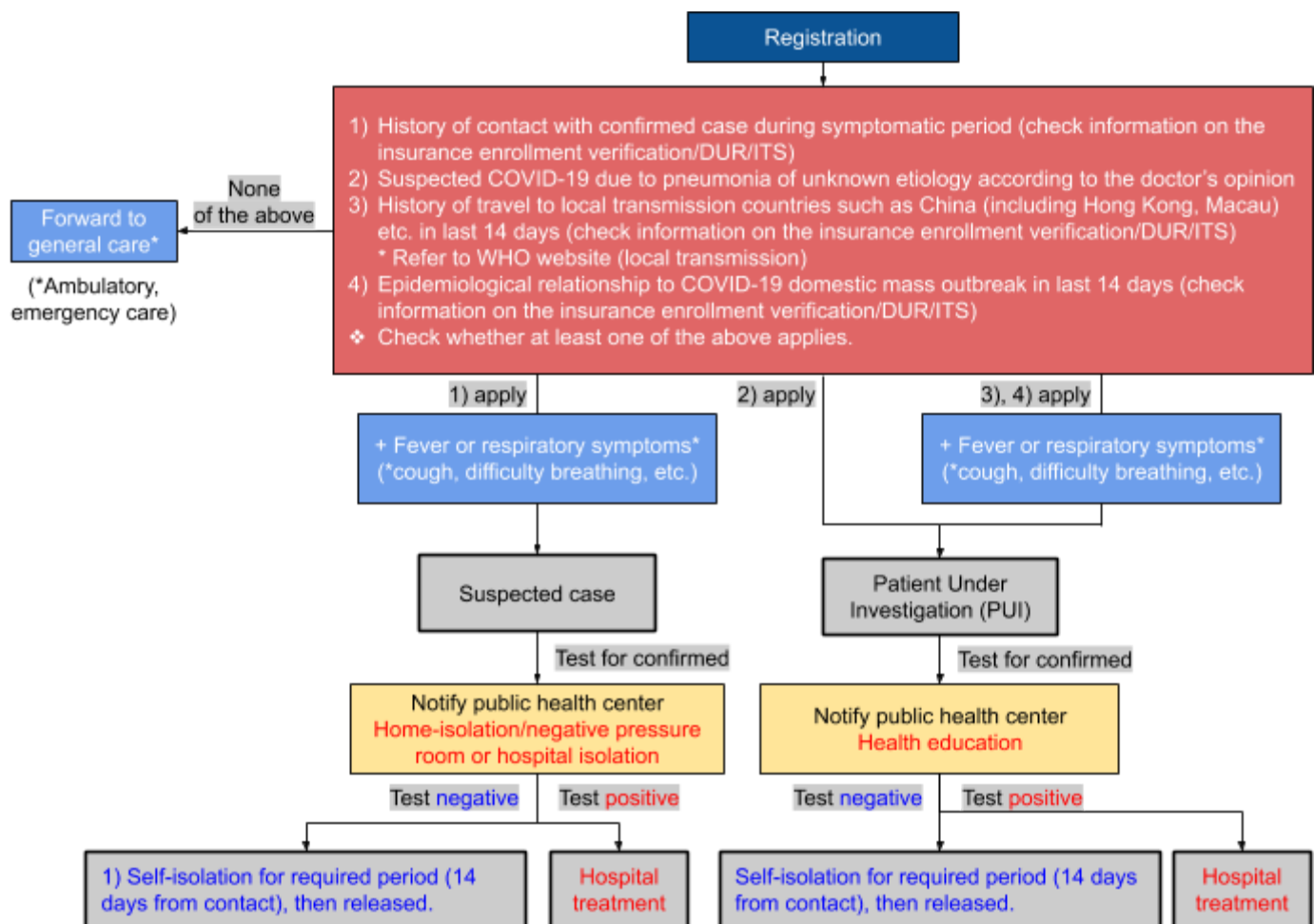


Figure 1. COVID-19 Screening Center Response Procedures

### 3. Request for Specimen Collection and Testing

For details, refer to Reference 2 Coronavirus Infection-19 Gene (PCR) Test Guide

#### 1) Specimen collection

- i. **Collection site:** A COVID-19 Screening Center or an isolated specimen collection site within a healthcare facility separated from other areas
  - \* However, in the case of home isolation, the specimen collection site may vary based on its location.
- ii. **Type of specimen:** Collect upper respiratory tract specimen (oropharyngeal and nasopharyngeal swab); if patient experiences cough or sputum, collect lower respiratory tract specimen.
  - \* Patient with mild symptoms: request testing of upper respiratory tract specimens only
  - **Upper respiratory tract specimen:** Collect nasopharyngeal and oropharyngeal specimens separately, place both specimens in a single viral transport medium, and transport with a completed *Form 1. Laboratory Test Request Form*.
    - \* For confirmed cases: after initial positive testing result and before release from isolation, collect additional specimens (blood specimen SST 5~10 mL, 1 mL for infants) including stool and urine if possible



- **Lower respiratory tract specimen:** Instruct patients to rinse their mouth with clean water and collect sputum by having them cough deeply without saliva into a sterile container (e.g. sputum bucket).

## 2) Specimen packaging

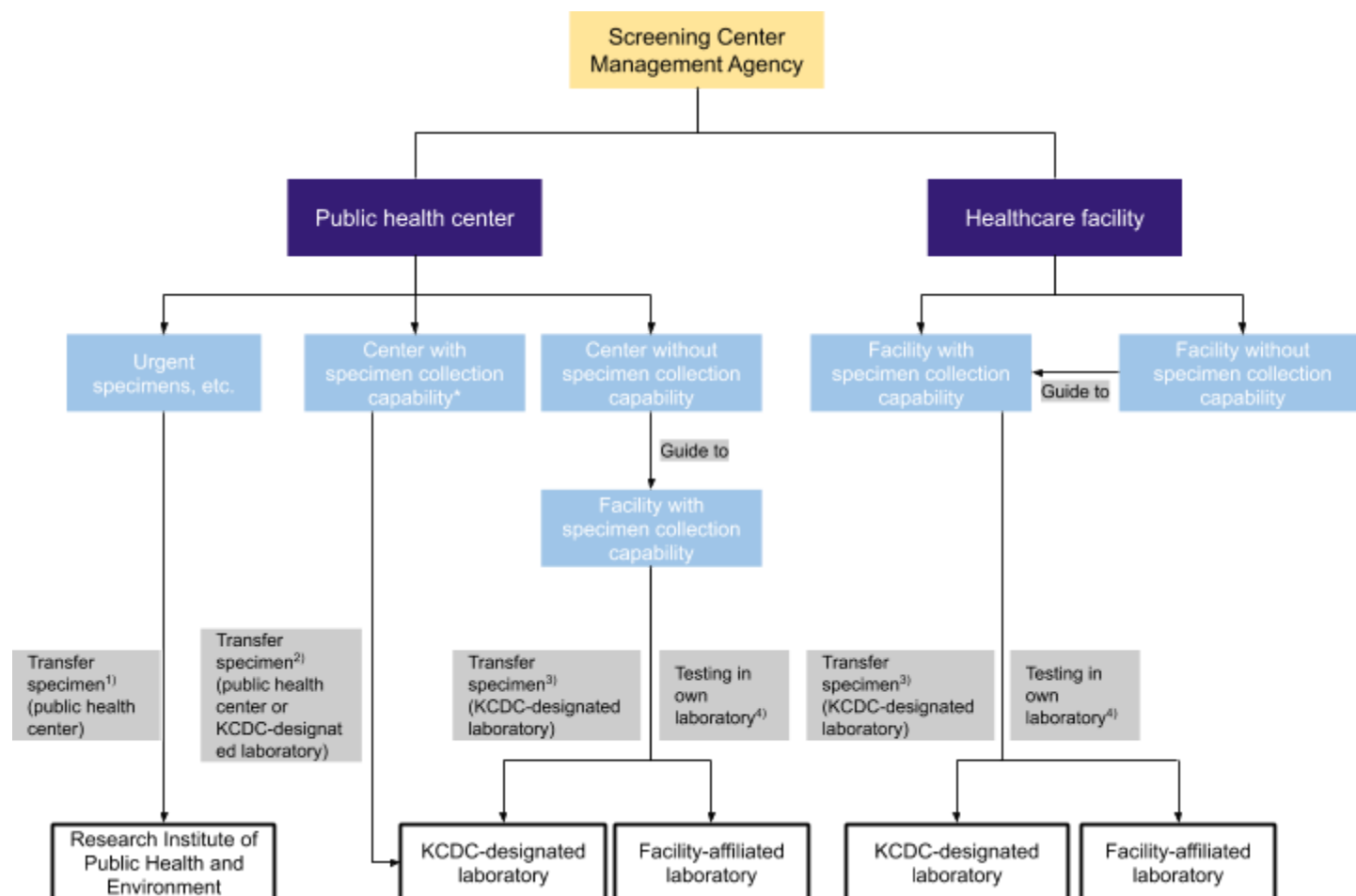
- Disinfect primary container containing collected specimens with 70% ethanol, and label the container.
  - \* Display information such as hospital name, specimen type, collection date, patient name, sex, and age
- Wrap the disinfected primary container with an absorbent material (e.g. paper towel) and place inside a secondary container.
- Tightly close the lid of the secondary container and place inside a tertiary container.
- Place *Form 1. Laboratory Test Request Form* under tertiary container's lid and pack closed tightly.
- On outside of the tertiary transport container, write the sender, receiver, and emergency contact information.
- Place the tertiary transport container into an ice box, and then insert refrigerants (ice packs) around all four sides of the container.
- Mark outside of the sealed ice box with Infectious Substances label, UN 3373 (Biological Substance Category B) label, package handling label ("This way up"), sender, receiver, and emergency contact information.
- Precautions: When collecting specimens, it is **essential to wear** Personal Protective Equipment (PPE) such as **KF94 or equivalent respiratory mask, disposable gloves, disposable long sleeve gown or full-body protective suit**, and **goggles or face shield (if necessary, also wear disposable impervious medical apron)** and disinfect oneself after the collection.
- Refer to Table 1. COVID-19 PPE Recommendation by Situation and Forms of Exposure

## 3) Testing request

Transport the specimen to an on-site or KCDC-designated laboratory

- ❖ Enter testing request information into: Integrated Disease & Health Management System - Infectious Disease Management Integrated Information Support - Testing Request

## **System for transferring specimens from COVID-19 screening centers**



### **Note when transferring specimens**

- 1) For specimens collected for epidemiological investigation or specimens marked as urgent at public health centers, transfer specimens immediately regardless of the standard transport schedule.
- 2) Public health centers with specimen collection capability will transfer specimens following a predetermined and regular pick-up schedule (minimum 2-3 times per day).
- 3) Transfer specimens as soon as possible if a healthcare facility requests that specimens be tested at a KCDC-designated laboratory.
- 4) If testing capacity is exceeded at a healthcare facility-affiliated laboratory, KCDC-designated laboratories may be requested to test specimens.

### **Criteria for determining which public health centers are capable of collecting specimens (example)**

- Public health centers located in areas of poor medical accessibility must be included (ex. islands with little to no healthcare facilities, areas with poor access to COVID-19 screening centers in healthcare facilities, etc.)
- Public health centers with facilities equipped for a COVID-19 screening center and with adequate number of skilled workers that apply for specimen collection

## **4. Infection Control at COVID-19 Screening Center**

- 1) Instruct suspected COVID-19 cases to wear surgical masks (patient condition permitting, may wear KF94 or higher-grade mask).
- 2) It is recommended that healthcare providers participating in patient care use masks (KF94 or higher), disposable gloves, long-sleeved gowns, and goggles or face shields, and when performing

respiratory droplet-producing procedures, Level D PPE use is recommended. Before and after patient care, hand hygiene (handwashing with soap and water or hand sanitization) is performed.

- i. Be aware of contact with the patient's body, body fluids, blood and respiratory secretions during patient care activities.
- ii. Use disposable or single-use equipment, such as thermometers, etc., for each patient as much as possible.
- iii. Use single-use equipment which is disposed appropriately\* whenever possible, and when they must be reused, disinfect thoroughly prior to reuse.

\* In accordance with *Article 4 of the Waste Control Act (Types of Medical Waste)*, this refers to waste produced from providing medical care to persons that are isolated to protect others from infectious diseases, including tissue/pathology specimens, damaged and soiled laundry (patient bedding, clothes, linens with patient secretions), etc.

### 3) Disinfection of COVID-19 Screening Centers

- i. **Areas to disinfect:** Door handles, waiting area chairs, reception desks, screening room chairs (or beds), etc. following the patient's path through the screening center
- ii. **Environmental disinfectant:** Use approved antiviral disinfectants including sodium hypochlorite (1000ppm recommended), alcohol (for localized surfaces), etc.

\* When using disinfectants, follow the recommendations such as dilution ratio, contact time, and handling precautions provided by the manufacturer.

## 5. Requirements for Each Area of the COVID-19 Screening Center

### 1) Entrance inspector

- i. Respiratory symptoms and body temperature measurement personnel should wear long-sleeved gowns, disposable gloves, and masks (KF94 or higher).
- ii. When guiding a patient to a COVID-19 Screening Center, be sure to guide from a distance more than 2 meters away.
- iii. For patients being guided to a COVID-19 Screening Center, have them wear a surgical mask (KF94 or higher if possible).
  - ❖ In the case that a patient needs help moving to a COVID-19 Screening Center (including when accompanied by a guardian), wear protective suit, disposable gloves, and masks (KF94 or higher) and guide the visitor to the COVID-19 Screening Center. (Use wheelchair if necessary)

### 2) Waiting room for patients with respiratory symptoms-fever

- While the patients are waiting, have them wear a surgical mask (KF94 or higher if possible) and maintain a distance of 1 meter or greater.

### 3) Specimen collection areas

- i. **Separation of space:** The specimen collection area shall be **separated from other areas** such as waiting rooms or screening rooms.
- ii. **Ventilation:** Utilize **negative pressure equipment** to prevent aerosol infections during specimen collection; if there is no negative pressure equipment, open the window afterwards to allow ventilation, or collect specimens in **an open outdoor area with limited (or controlled) visitor inflow**.
  - If equipped with negative pressure equipment, close doors and windows except when entering.
  - In the case of natural ventilation (not negative pressure), leave doors and windows open at all

times to maximize ventilation.

- If the specimen collection site is a negative pressure facility, it can be reused at least 30 minutes after properly disinfecting the surfaces; for an indoor space without negative pressure equipment, consider various factors, such as the number of ventilations\* according to the ventilation requirements (number and location of windows, weather etc.) for resuming use.

\* Ventilation Frequency and Ventilation Rate During Natural Ventilation and Reduction of Droplet Nuclei Concentration According to Ventilation Rate and Time<sup>2</sup>

| ▼ Ventilation frequency and rate during natural ventilation |                             |                        |
|---|-----------------------------|------------------------|
| Opening degree  | Ventilation frequency (ACH) | Ventilation rate (l/s) |
| Open window (100%) + open door                              | 37                          | 1300                   |
| Open window (50%) + open door                               | 28                          | 975                    |
| Open window (100%) + close door                             | 4.2                         | 150                    |

| ▼ Reduction of droplet nuclei concentration (%) with ventilation rate and time |                             |        |        |        |
|--|-----------------------------|--------|--------|--------|
|  | Ventilation frequency (ACH) |        |        |        |
| Time (minutes)   | 6                           | 12     | 18     | 24     |
| 0  | 100.00                      | 100.00 | 100.00 | 100.00 |
| 10   | 37.00                       | 13.50  | 4.98   | 1.83   |
| 20   | 13.50                       | 1.83   | 0.25   | 0.03   |
| 50   | 0.67                        | 0.00   | 0.00   | 0.00   |
| 60   | 0.25                        | 0.00   | 0.00   | 0.00   |

ACH (Air Changes per Hour)

- ❖ Assuming wind speed of 1 m/s, room dimension of 7×6×3m, window dimension of 1.5×2m<sup>2</sup>, door dimension of 1×2m<sup>2</sup>×2m<sup>2</sup>
- ❖ The average half-life of coronavirus in the environment is reported as 30 minutes to 1 hour<sup>3</sup>; After 30 minutes under the condition of air circulation of 12 times per hour, less than 1% of air remains<sup>4</sup>

- Disinfection:** After specimen collection, disinfect surfaces that came into contact with or within distance of droplet contamination from the patient.

<sup>2</sup> Natural Ventilation for Infection Control in Health-Care Settings, WHO, 2009

<sup>3</sup> Stability of Middle East respiratory syndrome coronavirus (MERS-CoV) under different environmental conditions, Eurosurveillance Weekly, 19 September 2013

<sup>4</sup> Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health-Care Settings, 2005 MMWR December 30, 2005 / Vol. 54 / No. RR-17

#### 4) Patient transfer

- i. When transporting a patient (suspected patient), all close contact personnel should wear a mask (KF94 or higher), disposable gloves, long-sleeved gowns, etc.
- ii. Prior to the arrival of the patient (suspected patient), contact the patient's transfer location and notify them to prepare for the patient.
- iii. Transporter Precautions
  - Wear disposable gloves when in contact with all patients (suspected patients)
  - Wear disposable gowns when in direct contact with patients (suspected patients)
  - Wear protective glasses (goggles) when working within 2 meters of patients (suspected patients)
  - Ensure that mask (KF94 or higher) fits appropriately without air leakage
- iv. The following protocols should be followed for patients (suspected patients)
  - Provide a surgical mask (patient condition permitting, may provide KF94 or higher) to patient (suspected patient)
  - If oxygen is needed during transportation, supply through a non-rebreather mask

## 6. Use of Personal Protective Equipment (PPE)

### 1) Select the appropriate PPE based on the recommendation\*

- Select based on the situation and forms of exposure (direct contact, aerosol generating procedures etc.) with the patients (suspected patients)

\* Refer to **Table 1. COVID-19 Personal Protective Equipment (PPE) Recommendation by Situation and Forms of Exposure**

### 2) Use PPE properly according to guidelines (donning and doffing)

\*see **Attachment 2**

**Table 1. COVID-19 PPE recommendations by situation and forms of exposure**

| Situation  | PPE                    |                    |                       |                                |   |                                   |                      |
|--|------------------------|--------------------|-----------------------|--------------------------------|---|-----------------------------------|----------------------|
|  | Respiratory protection |                    |                       | Body protection                |   |                                   | Eye protection       |
|  | Surgical mask          | KF94 or equivalent | Electronic respirator | Disposable gloves <sup>5</sup> | Disposable waterproof long-sleeved gown | Coveralls (including shoe covers) | Goggles/ face shield |
| POE screening (epidemiological investigation)                  |                        | ●                  |                       | ●                              |   | ●                                 | ●                    |
| Screening center reception desk                                |                        | ●                  |                       | ●                              | ●                                       |                                   |                      |
| Screening center administrative staff                          |                        | ●                  |                       | ●                              | ●                                       |                                   |                      |
| Screening center clinical staff                                |                        | ●                  |                       | ●                              | ●                                       |                                   | ●                    |
| Transport (ambulance driver) <sup>6</sup>                      |                        | ●                  |                       | ●                              |   |                                   |                      |
| Transport (quarantine officer, PHC personnel, EMT, etc.)       |                        | ●                  |                       | ●                              |   | ●                                 | ●                    |
| Ambulance disinfection   |                        | ●                  |                       | ●                              |   | ●                                 | ●                    |
| Suspected patient care: entering room, evaluating, and nursing |                        | ●                  |                       | ●                              | ●                                       |                                   | ●                    |
| Aerosol-generating procedures <sup>7</sup>                     |                        | ●                  |                       | ●                              | ●                                       |                                   | ●                    |
| Examination: X-ray and other imaging                           |                        | ●                  |                       | ●                              | ●                                       |                                   | ●                    |
| <b>Respiratory</b>   |                        | ●                  |                       | ●                              | ●                                       |                                   | ●                    |

<sup>5</sup> Double-glove while examining, treating, nursing, testing, or cleaning around suspected or confirmed positive patients to mitigate risk of exposure from glove perforation

<sup>6</sup> If driving an ambulance without a barrier separating the driver's seat from the patient compartment, wear a full-body suit, shoe covers, KF94-equivalent respiratory protection equipment, and gloves; wear goggles/face shield if necessary

<sup>7</sup> Aerosol-generating treatments include endotracheal intubation, cardiopulmonary resuscitation, bronchoscopy, aspiration of airway secretions, tracheostomy care, autopsy, continuous positive air pressure, nebulizer therapy, procedures involved for sputum induction

| specimen collection                                    |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|
| Specimen handling<br>(laboratory, etc.) <sup>8,9</sup> |   | ● | ● | ● | ● |   | ● |
| Specimen transport<br>(in intact package)              |   |   |   | ● |   |   |   |
| Dead body transport                                    |   | ● |   | ● |   | ● |   |
| Patient room cleaning<br>and disinfection              |   | ● |   | ● | ● |   | ● |
| Healthcare waste<br>disposal<br>and handling           |   | ● |   | ● | ● |   | ● |
| Healthcare waste<br>transport                          | ● |   |   | ● | ● |   |   |

\*Reference: Coronavirus Disease 2019 Response Guidelines (For Local Governments) Appendix 9

<sup>8</sup> In specimen-handling labs or exam rooms, refer to guidelines from the KCDC Biological Safety Board for PPE choice, use, and maintenance

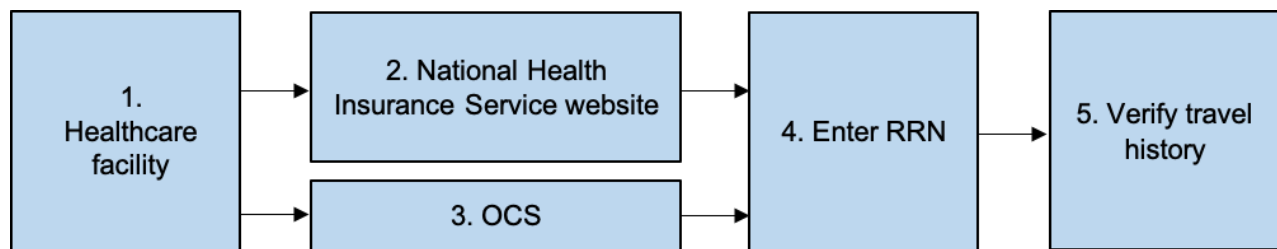
<sup>9</sup> Wear a long-sleeved gown and disposable gloves while working on a Class II biosafety workbench

Lee H, Ki C-S, Sung H, et al. Guidelines for the Laboratory Diagnosis of Middle East Respiratory Syndrome Coronavirus in Korea. Infection & chemotherapy. 2016; 48 (1): 61-69.)

## Attachment 1. Travel History Verification

### 1. Patient Registration Stage

- 1) Patient visits a healthcare facility
- 2) Healthcare facility verifies if a patient is subject to overseas infectious diseases through either the National Health Insurance Service website ([www.nhis.or.kr](http://www.nhis.or.kr)) or the OCS ((Medical) Order Communication System)
- 3) Enter the patient's Resident Registration Number (RRN) to verify the patient's international travel history



\* Glossary of phrases used by the insurance enrollment verification system

| Category                          | Phrase used by the system                             |
|-----------------------------------|---|
| Traveler arriving from China      | COVID-19 traveler arriving from China                 |
| Traveler arriving from Asia       | COVID-19 traveler arriving from affected part of Asia |
| Close contact of a confirmed case | Close contact of a confirmed COVID-19 case            |



## 2. Patient Care/Treatment, Prescription and Dispensing Steps

- ITS (International Traveler Information System)
  - Registration step: Automatically check and display the overseas travel history of all patients upon registration
    - \* For institutions that do not use DUR, it can be downloaded and installed from the Health Insurance Review and Assessment Service website
  - Treatment step: When querying patient's information, overseas travel history is provided through a pop-up window
- DUR (Drug Utilization Review) System
  - Prescription step: Upon prescription, DUR system provides international travel history
    - ❖ Messages used by the ITS/DUR system
  - Information regarding arrivals from China

### Notice from Korean Centers for Disease Control & Prevention

This enrollee (patient) is a traveler arriving from China (including Hong Kong and Macau). If he/she experiences fever or respiratory symptoms (cough, difficulty breathing, etc.), please report to 1339 or the local public health center.

- ❖ Precautions for medical institutions: 1) Keep the reportable patient in an isolated/separate area and do not allow them to return home, 2) ensure that the reportable patient, medical personnel and staff are wearing masks
- ❖ Take precautions not to release personal information without patient consent; patient might refuse treatment if breach of privacy occurs

- Information regarding arrivals from other Asian countries

### Notice from Korean Centers for Disease Control & Prevention

This enrollee (patient) is an arriving traveler from a country in Asia affected by COVID-19. Take this into account during care/treatment and if they experience fever or respiratory symptoms (cough, difficulty breathing, etc.), please report to 1339 or the local public health center.

- \* Major affected Asian countries: Singapore, Japan, Thailand, Vietnam, Taiwan, Malaysia
- ❖ Precautions for medical institutions: 1) Keep the reportable patient in an isolated/separate area and do not allow them to leave the hospital, 2) ensure that the reportable patient, medical personnel and staff are wearing masks
- ❖ Take precautions not to release personal information without patient consent; patient might refuse treatment if breach of privacy occurs

- Information regarding close contacts of confirmed cases

Notice from Korean Centers for Disease Control & Prevention

This enrollee (patient) had contact with a confirmed case of COVID-19. If he/she experiences fever or respiratory symptoms (cough, difficulty breathing, etc.), please report to 1339 or the local public health center.

- ❖ Precautions for medical institutions: 1) Keep the suspected patient in an isolated/separate area and do not allow them to return home, 2) ensure that the suspected patient, medical personnel and staff are wearing masks
- ❖ Take precautions not to release personal information without patient consent; patient might refuse treatment if breach of privacy occurs

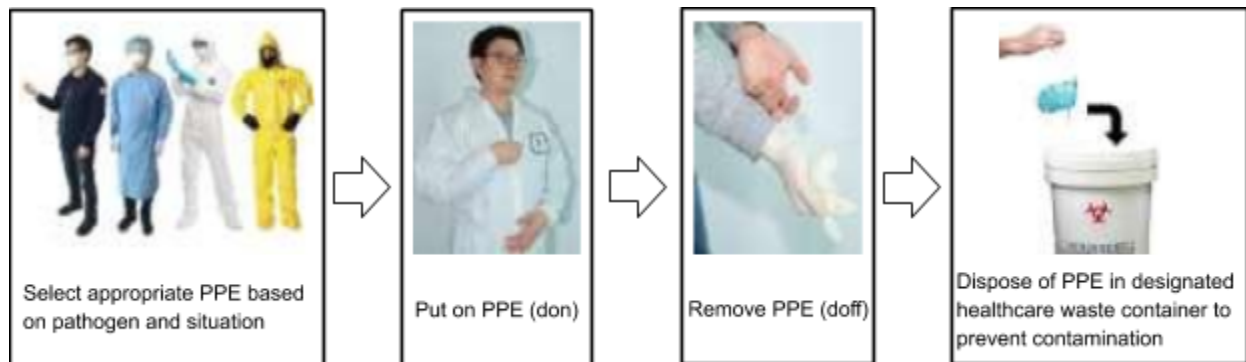
## Attachment 2. COVID-19-Related Use of PPE

### 1. Scope of Application

- All procedures related to suspected and confirmed cases, as well as close contacts of confirmed cases of COVID-19
- E.g. Port-of-entry screening, transfer, epidemiological investigation, screening, patient evaluation, treatment, specimen collection or transfer, testing, surgery, handling of equipment, environmental management, and handling of human remains

### 2. Key Contents

- Types of Personal Protective Equipment (PPE), selection, precautions for donning and doffing, and proper disposal as healthcare waste



### 3. Usage Rules:

- **All equipment and devices must be disposable**, except for equipment/items that have to be reused
- Reusable/non-disposable equipment must be disinfected or sterilized as per manufacturer recommendations
- Provide education/training for proper usage of PPE<sup>10</sup>
  - Selection, use, management, and disposal of appropriate PPE
  - For non-disposable items, store after proper disinfection
- Things to consider for selecting PPE
  - Select and use appropriate PPE based on the type of disease, transmission route, conditions of exposure to infection (contact, droplet, aerosol, splash of blood/other bodily fluids), and purpose
  - Consider compatibility and durability of PPE per condition and type of procedure
- Put on PPE before coming into contact with source of infection (e.g. before contact with a patient, outside a quarantine/isolation room)
  - Follow guidelines for each item of PPE (especially the close fit of respiratory protection equipment)
- Ensure that contaminated PPE does not contaminate the surrounding environment while removing and properly dispose of it after removing (into healthcare waste container)



<sup>10</sup> Compliance with the Industrial Safety and Health Act



- Avoid contact with surroundings other than with the patient while wearing PPE
- When removing PPE, avoid contaminating own body parts and surroundings
- Remove PPE away from source of infection (e.g. in locker room outside of the isolation room)
  - Dispose of damaged or contaminated PPE; do not use or store them
  - Practice strict personal and hand hygiene (hand-washing or sanitizing) after removing PPE; hands, body parts, and/or clothing can be contaminated unknowingly and without being visibly soiled
  - Requirements for PPE

| Protection target  | PPE type   | Required       | PPE requirements/<br>Applicable conditions  |
|--------------------|--|----------------|---|
| Respiratory system | Disposable KF94* or higher grade respiratory protection equipment            | Yes            | -   |
|                    | PAPR (replacement for KF94 or higher grade respiratory protection equipment) | When necessary | When performing aerosol-generating procedures (replacement for KF94 or higher grade respiratory protection equipment) |
| Eye                | Goggles (or Face shield)   | Yes            | Anti-fogging & anti-scratch coating   |
| Full body          | Disposable full-body protective suit   | Yes            | Waterproof / maintain waterproofness for at least 2-3 hours; must be impermeable to blood or virus                    |
|                    | Disposable gloves  | Yes            | Must cover wrists; wear two sets  |
|                    | Disposable shoe covers   | Yes            | Must cover ankles; made of non-slippery material  |
|                    | Disposable medical apron/gown cover  | When necessary | Must cover from torso to knees; e.g. during dialysis or CRRT  |

\* Translators' note: KF94 is equivalent to the N95 mask used in other countries

- PPE-specific characteristics and indications for use

| Item                                    | Hazard  | Indications for use   | Picture   |
|---|---|---|---|
| Disposable gloves                       | Contact   | <ul style="list-style-type: none"> <li>• Hand protection</li> <li>• Pick appropriate material considering the level of exposure</li> <li>• If allergic to powder, use powder-free or nitrile product</li> </ul> |  |
| Disposable waterproof long-sleeved gown | Blood or bodily fluids splashing on body or clothes | Prevents further indirect spread of pathogens via viral droplets on body and clothes  |  |

|   |   |   |   |
|---|---|---|---|
| Full body protective suit (coveralls) <sup>11</sup>                 | Blood or bodily fluids splashing on body or clothes           | Prevents further indirect spread of pathogen via viral droplets on body and clothes   |    |
| Shoe covers   |   |   |   |
| Boots   | Blood or bodily fluids splashing on shoes                     | Use instead of shoe covers: <ul style="list-style-type: none"> <li>• When floor is wet or extensively soiled</li> <li>• Based on exposure risk</li> </ul>   |    |
| Hair cap  | Soiling of hair   | Prevents droplets from contaminating hair   |    |
| Goggles   | Blood or bodily fluids splashing onto ocular mucous membranes | <ul style="list-style-type: none"> <li>- Prevents infection of ocular mucous membranes</li> <li>- For reuse, clean with antiviral disinfectant</li> </ul>   |    |
| Face shield   | Blood or bodily fluids splashing onto ocular mucous membranes | <ul style="list-style-type: none"> <li>- Prevents infection of ocular mucous membranes and face</li> <li>- Depending on exposure risk, can use instead of goggles</li> <li>- For reuse, clean with antiviral disinfectant</li> </ul>  |   |
| KF94 or higher grade respiratory protection equipment <sup>12</sup> | Inhalation of droplets or aerosols                            | <ul style="list-style-type: none"> <li>- Prevents inhalation of pathogen particles via nasal or oral mucous membranes</li> <li>- Usage examples: <ul style="list-style-type: none"> <li>• When entering confirmed or suspected patients' quarantine/isolation room (including all healthcare workers and visitors)</li> <li>• During sputum induction</li> <li>• During aerosol-generating procedures</li> <li>• When transporting suspected or confirmed patients</li> </ul> </li> </ul> |  |
| PAPR respiratory protection equipment <sup>13</sup>                 | Inhalation of droplets or aerosols                            | <ul style="list-style-type: none"> <li>- Prevents inhalation of pathogen particles via nasal or oral mucous membranes</li> <li>- Requires thorough inspection and maintenance, including regular battery charge, filter exchange, and device disinfection</li> <li>- Check for damage and malfunction prior to use; ensure routine repair, exchange, or disposal</li> <li>- If reuse is unavoidable, disinfect prior to reuse and storage</li> </ul>                                      |  |

<sup>11</sup> Select protective clothing with protection against infectious materials. For example, in Europe, under EN14126, ASTM1671 regulations, use protective clothing marked with a biohazard label.

<sup>12</sup> Respirator: protective gear worn to prevent inhalation of pathogenic particles when breathing

<sup>13</sup> PAPR: powered air-purifying respirator

## 4. Donning and Doffing PPE

- How to don (put on) PPE
  - Prepare all equipment beforehand according to PPE recommendations per healthcare setting and put on equipment in proper sequence and method
  - \* Tie hair back in a secure manner and remove watch, jewelry, etc. to prevent contamination
  - \* In cases of contamination or damage to PPE when worn, change PPE before next treatment or provision of care
- How to doff (take off) PPE
  - Remove PPE in a location safe from the source of pathogen (e.g. changing room outside isolation room) and be careful not to contaminate body parts and surroundings
  - Take caution not to contaminate surroundings while removing PPE, and do so in the proper sequence and method; immediately discard them in designated healthcare waste box

| Category   |   | Sequence for KF94 respiratory protection equipment and coveralls | Sequence for PAPR and coveralls |
|--|---|--|---------------------------------|
| <b>Donning order</b>   | 1 | Hand hygiene   | Hand hygiene                    |
|  | 2 | (Inner) Gloves   | (Inner) Gloves                  |
|  | 3 | Lower part of full-body protective suit                          | Full-body protective suit       |
|  | 4 | Shoe covers (or boots)   | Shoe covers (or boots)          |
|  | 5 | KF94 or higher grade respiratory protection equipment            | PAPR <sup>14</sup>              |
|  | 6 | Goggles (or face shield)   | Hood                            |
|  | 7 | Wear and tighten upper hood of full-body protective suit         | Connect PAPR and hood           |
|  | 8 | (Outer) Gloves   | (Outer) Gloves                  |
| (Remove PPE outside of infectious areas such as isolation rooms) |   |  |                                 |
| <b>Doffing<sup>15</sup> order</b>                                | 1 | (Outer) Gloves   | (Outer) Gloves                  |
|  | 2 | Glove disinfection   | Glove disinfection              |
|  | 3 | Full-body protective suit  | PAPR                            |
|  | 4 | Shoe covers (or boots)   | Hood                            |
|  | 5 | Glove disinfection   | Full-body protective suit       |
|  | 6 | Goggles (or face shield)   | Shoe covers (or boots)          |

<sup>14</sup> Follow manufacturer instructions for putting on and taking off PAPR and hood since it can be different for each product.

<sup>15</sup> The inner glove can be contaminated while taking off the PPE. Therefore, it is useful to sanitize the gloved hand after removing each element of the PPE.

|  |   |   |                |
|--|---|---|----------------|
|  | 7 | KF94 or higher grade respiratory protection equipment | (Inner) Gloves |
|  | 8 | (Inner) Gloves  | Hand hygiene   |
|  | 9 | Hand hygiene  | -              |

**Level D PPE - Donning and doffing (example)**

# Level D

Donning PPE



Ready to don PPE



Don inner gloves



Check bodysuit



Check zipper cover



Zip up fully



Secure thumb ring



Tie overshoe laces



Ready to don N95



Don N95



Check N95 fit



Don goggles



Pull up bodysuit hood



Check bodysuit fit



Don outer gloves



Confirm proper PPE fit





# Level D

## Doffing PPE



## Reference 1. Example of Installation of an Isolation Space

Reference: Middle East Respiratory Syndrome (MERS) Infectious Disease Control Institution Operational Response Guidelines (National Medical Center, 2015)

- 1) Isolation space is single occupancy as a general rule, and a restroom is provided in isolation space.
- 2) If multiple patients are to be placed in one isolation space, separate suspected cases from patients who are not.
- 3) If there is no negative pressure capability, ensure adequate ventilation and control nearby access to avoid exposure to the public.
- 4) Mobile toilets and similar structures are to be installed in restrooms within isolation space, and the restroom must be separated from the waiting room.

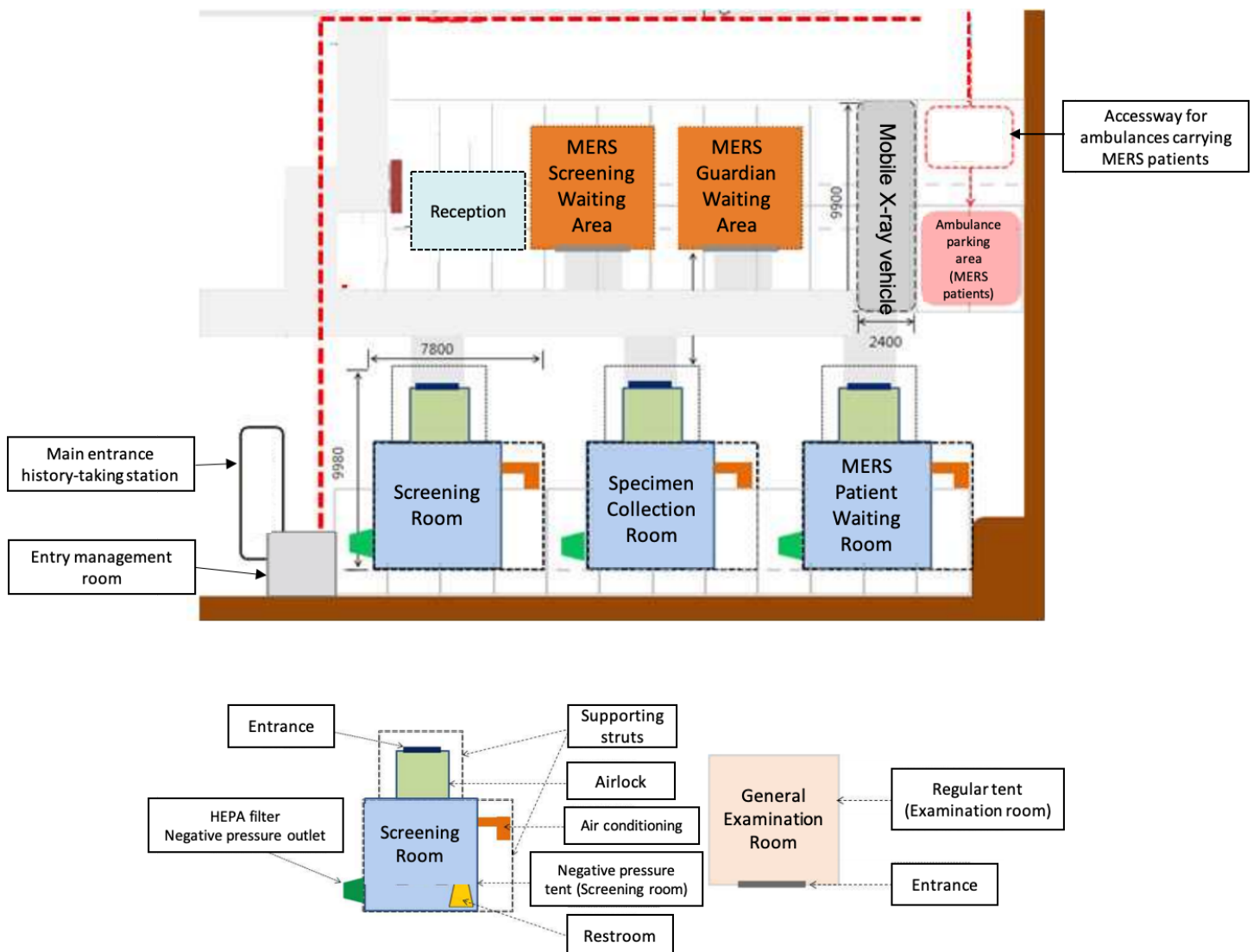


Figure 1. Example of COVID-19 Screening Center installation (installed in a separate location)

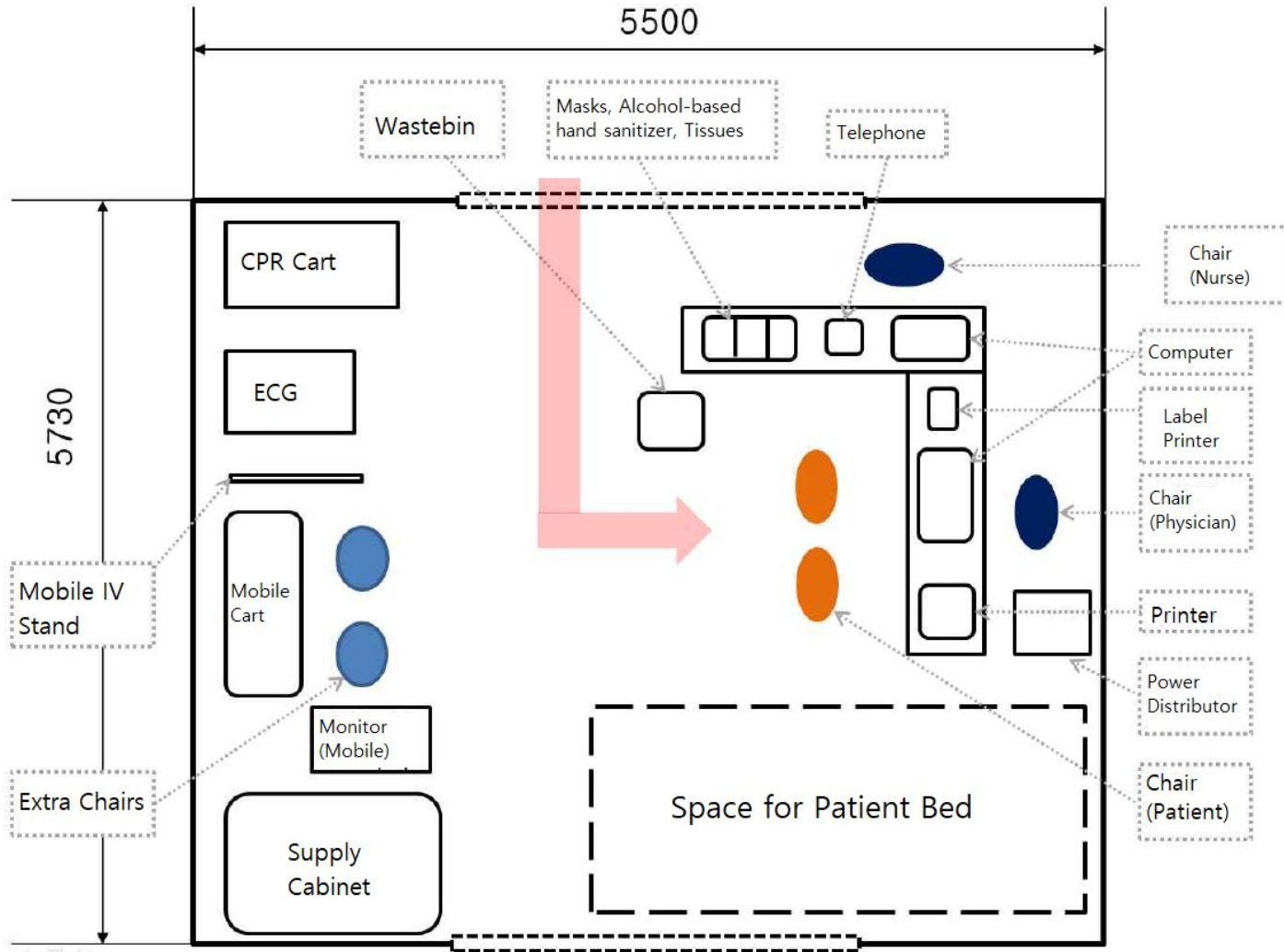
**❖ Internal view of the screening room**

Figure 2. Example of an interior plan of a Screening Room (interior installation)



### ❖ Example of a negative pressure tent installation



### ❖ Example of a regular tent installation

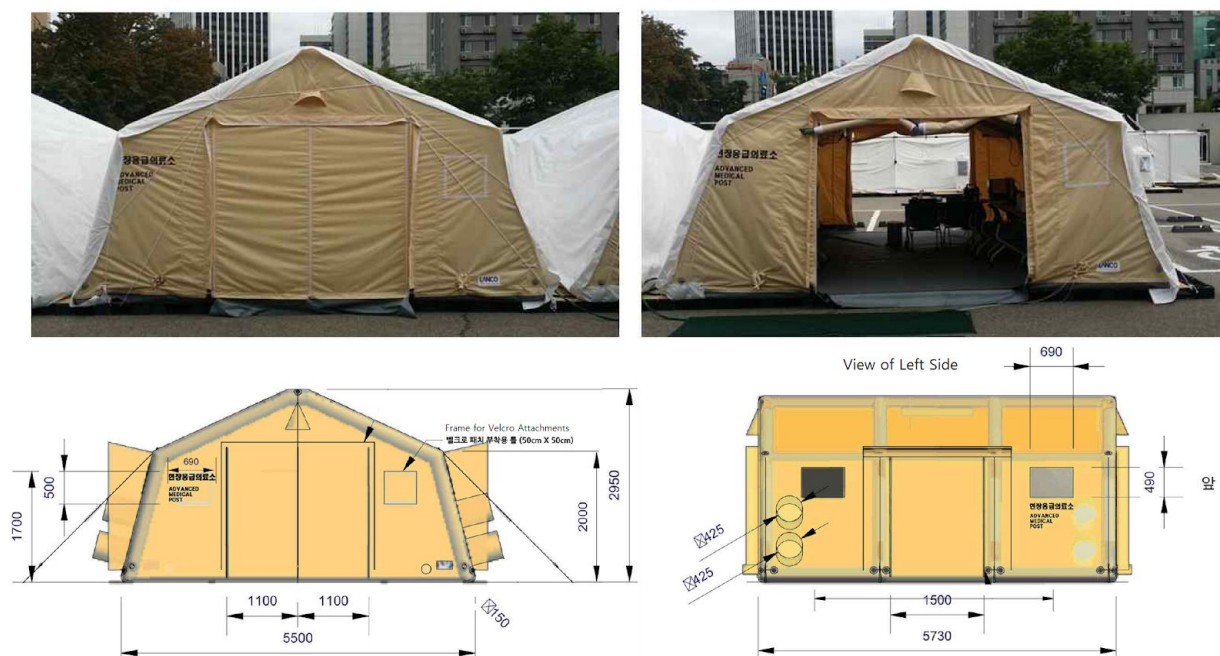


Figure 3. Installation of negative pressure tent and regular tent

## Reference 2. COVID-19 PCR Test Guide

Reference: Coronavirus Disease 2019 Response Guidelines (7th Edition) (For Local Governments) (VIII. Laboratory Testing Management)

### 1. Specimen Collection

#### A. Specimen Collection Site

- **Collection site:** A COVID-19 Screening Center or an Isolated Specimen Collection Site within a medical facility separated from other areas
- \* However, in the case of home isolation, the specimen collection site may vary based on its location

#### B. Specimen Type and Packaging

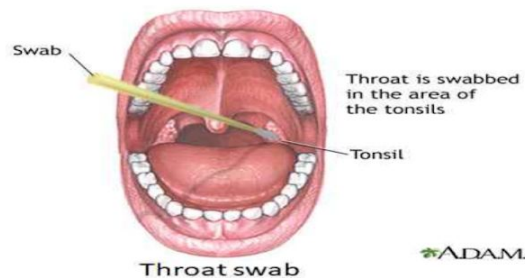
- **Type of specimen:** Collect upper respiratory tract specimen (oropharyngeal and nasopharyngeal swab); if patient experiences cough or sputum, collect lower respiratory tract specimen
- For patient with mild symptoms: Request testing of upper respiratory tract specimens only

| No. | Type of specimen        |   | Container/Volume  | Remarks  |
|-----|-------------------------|---|---|--|
| 1   | Upper Respiratory Tract | <ul style="list-style-type: none"> <li>· Oropharyngeal swab</li> <li>· Nasopharyngeal swab</li> </ul> | <ul style="list-style-type: none"> <li>· Container: Simultaneous collection of oropharyngeal and nasopharyngeal specimens in a single viral transport medium</li> </ul> | <ul style="list-style-type: none"> <li>· Collect specimen only at isolated specimen collection site</li> </ul>   |
| 2   | Lower Respiratory Tract | <ul style="list-style-type: none"> <li>· Sputum</li> </ul>  | <ul style="list-style-type: none"> <li>· Container: 50 mL sterile tube</li> <li>· Volume: obtain 3 mL or more</li> </ul>  | <ul style="list-style-type: none"> <li>· Collect specimen only from patients producing sputum</li> <li>· <b>Do not induce sputum</b> (may generate aerosol)</li> <li>· If sputum collection is required for accurate diagnosis, collect in a negative pressure room (if no negative pressure room is available, collect in isolated area with good external ventilation to avoid risk of aerosol generation and spread)</li> </ul> |

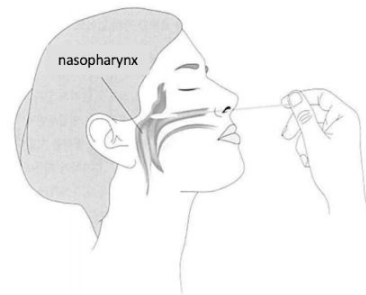
- **Required specimen:** Upper respiratory tract specimen; **Optional specimen:** Lower respiratory tract specimen, blood specimen, etc.
- \* For confirmed cases: After initial positive testing result and before release from quarantine, collect additional specimens (blood; if possible, stool and urine also). Collect 5~10 mL (1 mL for infant patients) of blood specimens in SST (Serum Separator Tube). Collect fecal and urine specimens in sterilized containers.
- ❖ Source: CDC, 2019 Novel Coronavirus, Wuhan, China, Guidelines for Clinical Specimens, 01/17/2020 ver.
- **Upper respiratory tract specimen:** Collect nasopharyngeal and oropharyngeal specimens separately, place both specimens in a single viral transport medium, and transport with a completed *Form 1. Laboratory Test Request Form*

- Nasopharyngeal swab: Insert cotton swab parallel to the roof of the oral cavity through the nostril to collect discharge by scratching the mid-lower section of the inferior turbinate; allow absorption of the discharge by pausing the cotton swab in the mid-lower section of the inferior turbinate for a few seconds
- Oropharyngeal swab: Press the tongue down and scratch the posterior pharyngeal wall to collect discharge

### How to use oropharyngeal swab



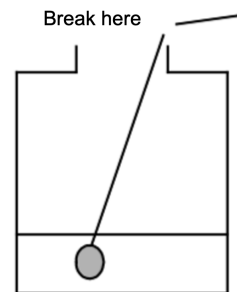
### How to use nasopharyngeal swab



Source: ADAM, Influenza, Pandemic Influenza Division (TEPIK)

### How to collect the upper respiratory tract specimen

- Storage of specimen containers
  - Insert cotton swab with specimen into bottle containing transport medium, and let soak; break the cotton swab at the bottle cap and close the lid tightly
  - When breaking, take care not to contaminate the inside due to contact
  - Specimen containers are immediately stored in the refrigerator (4°C)
- After collecting specimen, record the patient's identification information (name, sex, age) and collection date on the specimen container
- Request testing of specimen with completed *Form 1. Laboratory Test Request Form* (keep at 4°C)



- **Lower respiratory tract specimen:** Patients are instructed to rinse their mouths with clean water and cough deeply without saliva into a sterile container (e.g. sputum bucket) to collect sputum
  - \* Take care not to contaminate the specimen; seal completely to prevent leakage during transportation (triple packaging)






### How to collect sputum

#### ○ Specimen packaging

- Disinfect primary container containing collected specimen with 70% ethanol and attach label
- \* Display information including hospital name, specimen type, collection date, patient name, sex, and age
- Wrap disinfected primary container with an absorbent material (e.g. paper towel) and place inside a secondary container
- Tightly close the lid of secondary container and place inside a tertiary container
- Place *Form 1. Laboratory Test Request Form* under tertiary container's lid and pack closed tightly
- On outside of tertiary transport container, write the sender, receiver, and emergency contact information
- Place tertiary transport container into an ice box, and insert ice packs around all four sides of the container
- Mark outside of sealed ice box with Infectious Substances label, UN 3373 (Biological Substance Category B) label, package handling label ("This way up"), and sender, receiver, and emergency contact information

### Triple packaging example

| Category            | Primary container   | Secondary container  | Tertiary container  |
|---------------------|---|--|---|
| Packaging container |  |  |  |

### C. Precautions

- Precautions: When collecting specimens, it is **essential to wear** Personal Protective Equipment (PPE) such as **KF94\* or equivalent respiratory mask, disposable gloves, disposable long sleeve gown or full-body protective suit, goggles or face shield (if necessary, also wear disposable impervious medical apron)** and disinfect oneself after the collection.

- **Refer to Table 1. COVID-19 Personal Protective Equipment (PPE) recommendation by situation and forms of exposure**

\* Translators' note: KF94 is equivalent to the N95 mask used in other countries

## 2. Testing Request

- **Request method:** Fill out *Form 1. Laboratory Test Request Form* and submit with specimen

### \* Form 1. Laboratory Test Request Form

- **Testing request by institution:**
  - **COVID-19 Screening Centers within healthcare facilities:** Healthcare facilities capable of testing should carry out tests themselves; otherwise, send specimens to KCDC-designated laboratories (12 labs)\* for testing
  - **COVID-19 Screening Centers within public health centers:** Send specimens to KCDC-designated laboratories and request testing
    - \* If unable to request tests at KCDC-designated laboratories, request testing at Research Institute of Public Health and Environment (RIPHE)

## 3. Specimen Transport

### A. Specimen Transport Management

- When tested at private healthcare facilities: If on-site testing is possible, specimen transportation is unnecessary; if specimens need to be transported to KCDC-designated laboratory for testing, they must be transported following guidelines of testing laboratory
- When tested at Research Institute of Public Health and Environment (RIPHE): Designated personnel at the public health center that first identified the case should transport specimens to assigned RIPHE within the same jurisdiction
- \* Designated specimen transport personnel must wear KF94 or equivalent respiratory masks and gloves and confirm information on the type of specimen, collection date and time, and transport date and time; verified information must be reported to the RIPHE at KCDC

### B. Storage Conditions During Specimen Transport

- For specimens to be used in virus isolation or genetic testing: Transport immediately while maintaining the temperature at 4°C
- \* If impossible to transport within 72 hours, store at -80°C and transport using dry ice

### C. Precautions When Transporting Specimens

- Appoint personnel for transporting specimens
- Comply with guidelines for Safe Transport of Infectious Substances (provided by the KCDC)
- Selection of transport vehicles and specimen placement: Place packaged specimens in the trunk of a personal vehicle (or designated vehicles); secure specimens to minimize shaking; keep PPE, contamination treatment equipment (e.g. spill kit), disinfectant, emergency warning triangles, etc. in vehicle in case of emergencies



- Selection of driving route and precautions: Select shortest and safest route and depart only after reporting to the individual in charge at the facility; only take predetermined route (when using rest areas, required personnel must remain in vehicle with specimens); abide by traffic laws

## 4. Test Conduction

A. **Testing Facilities:** Genetic testing for suspected cases or for quarantine or isolation release\*

\* For confirmed case, testing is requested at an on-site or KCDC-designated laboratory based on status of patient (If confirmation is required due to indeterminate results, KCDC may be consulted)

B. **Research Institute of Public Health and Environment:** Testing performed in the following situations: 1) non-suspected cases require limited testing as part of epidemiological investigation to identify source of infection; 2) testing at private healthcare facilities is impossible (such as in overnight emergency)

\*Specimens must be collected at the public health center that first identified the case and testing should be requested at the RIPHE in the same jurisdiction as the public health center

- ❖ For first positive test result for patient: If test conducted by testing laboratory results positive, KCDC must perform second test for confirmation; for subsequent tests for given patient, individual testing facilities can determine test positivity without the confirmation from KCDC
- ❖ If test result is indeterminate, testing laboratory must re-examine remaining specimen and determine final result; if necessary, testing laboratory or health facility can re-collect and re-test specimens or make request to KCDC

## 5. Test Result Reporting

A. Testing Laboratory

- Notify test results to healthcare facility (public health center or other healthcare facility) that requested the test of suspected cases
  - Public health centers or healthcare facilities must enter test results into Integrated Disease & Health Management System (<http://is.cdc.go.kr>) - Patient Monitoring menu
  - Responsible medical personnel at healthcare facility should notify and explain test results to patient
  - **However, if the test result is positive, immediately report to KCDC Emergency Operations Center by phone (043-719-7789, 7790) and to public health center that requested the test**

B. Research Institute of Public Health and Environment

- Enter test result into Integrated Disease & Health Management System
  - **However, if the test result is positive, report immediately to KCDC Emergency Operations Center by phone (043-719-7789, 7790) and to public health center that first identified the case**

❖ The following is a form for cases referred to the Korea Centers for Disease Control and Prevention (KCDC). The form must be appropriately filled out and submitted when requesting the Research Institute of Public Health and Environment (RIPHE) for a test.

■ Test request guidelines by the KCDC [Attachment Form No. 7] <Revised 08/23/2019>

# Disclaimer

The original document was developed by the South Korean government and has been translated from Korean to English by a group of volunteers listed below.

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