Coronavirus Disease 2019 Management of Healthcare Facilities with Confirmed Cases

March 10, 2020

The Central Disaster Management Headquarters

The Central Disease Control Headquarters

The Korea Centers for Disease Control and Prevention

Management procedures for healthcare institutions with confirmed cases

Category	Field management protocol	Administrative organization
A. Organizing response team within healthcare facility	Form internal response team including the head of the healthcare institution under intensive management, infection control team, medical treatment department, nursing department, and administrative department; conduct general decision-making	Healthcare facility
B. Determining isolation scope / method	 (Scope of isolation) Establish isolation areas (wards, floors, hospital rooms, etc.) through risk assessment (confirmed patient's infectiousness, activity pattern, movement, scope*/number of contact persons, etc.) * Criteria: Clinical status of confirmed patient (respiratory symptoms such as cough and pneumonia), whether patient was wearing a mask, characteristics of the space in which the patient has stayed (air conditioning, ventilation, structural division, etc.), length of stay, use of space, means of movement, etc. (Method of isolation) Determined by the nature of the spaces that the confirmed patient has visited and their movement, the healthcare's ability to manage infections, etc. (single patient isolation, cohort isolation) 	Central/Municipal COVID-19 Immediate Response Task Force
C. Determining shut-down	· Determine whether to close the healthcare facility (full shut-down/partial shut-down on outpatient treatment, hospitalization, etc.) if there is high risk of transmission and isolation areas are wide	Central/Municipal COVID-19 Immediate Response Task Force
D. Designating healthcare facility under intensive management	• To prepare for the spread of infectious disease within healthcare facilities, designate healthcare facilities (in which which confirmed cases and close contacts have occured) that require intensive management such as adjusting the medical treatment space or closing all or part of the healthcare facility	Governor of a municipality or head of a city/county/district
	· Eliminate risk factors, determine the scope and method of isolation in healthcare facilities, and manage individuals under isolation/quarantine	
E. Managing healthcare facility under intensive management	 (Managing quarantined individuals) Strictly manage patients who are close contacts; they are subject to quarantine within the healthcare facility Place in single patient rooms; cohort quarantine depending on the situation of the healthcare facility Monitor development of fever, respiratory symptoms, diarrhea (twice a day) Quarantine and actively monitor healthcare provider/staff close contacts according to degree of contact Keep thorough hand hygiene when entering/exiting the quarantined area, and before administering patient care Minimize patient care in other wards 	Municipal COVID-19 Headquarters Immediate Response Task Force, City/county/district COVID-19 Headquarters, Healthcare facility
F. Releasing healthcare facilities from intensive	· Determine release of healthcare facility from intensive management when there is no additional occurrence of confirmed cases and each	Municipal COVID-19 Headquarters (Central

management	quarantine period of close contacts in the quarantine area of the healthcare facility have lapsed	COVID-19 Immediate Response Task Force
G. Resuming regular examination	 Determine whether to resume regular examination after confirming the establishment and implementation of the healthcare facility's infection control plan In case of full shut-down, the healthcare facility may be adjusted to partial shut-down and limited regular medical treatment may resume depending on exposure risk assessments after appropriate control measures are taken 	in fielessary)

This guide is for COVID-19 confirmed cases and close contacts in healthcare facilities; its purpose is to minimize the spread within the facilities and can be appropriately applied according to the situation of each facility

1. Eligible Facilities

• Healthcare facilities with COVID-10 confirmed cases and close contacts that require intensive management such as adjustments in clinical space and partial closure to mitigate further spread

2. Basic Preparations

- Healthcare Facility: Floor plans of the healthcare facility, names and medical records (including testing records) of confirmed cases and close contacts (from the same place of stay), the movement history of exposed patients and staff (including hospital room transfers), list of caregivers and visitors, CCTV, etc.
- Local Public Health Center: An understanding of available medical resources in the region (list of healthcare facilities by type and number of medical personnel by job type, transfer equipment, etc.) and medical supplies (PPE, hand sanitizer, etc.)

3. Procedures for Healthcare Facility Management

A. Organizing a Response Team Within Healthcare Facility

• Form a response team within the healthcare facility including the facility director and the departments of infection control, medicine, nursing, and administration

Composition of a response team within a healthcare facility (example)

Division	Role
Executive team	 Prepare response measures, mobilize human and material resources, conduct internal and external communication and executive decision making Oversee response operations (establish plans for epidemiological investigations and response measures, delegate of roles)

Epidemiological investigation	 Establish plans for epidemiological investigations, review case definition and case study Collect and analyse information (interview clinical staff, review medical records, conduct reenactment, etc.) Investigate contacts, individuals exposed at the same time as the confirmed case, and individuals with new onset of symptoms Manage patients, contacts, and high risk populations (treatment/isolation/quarantine/tracing, etc.) Collect specimens from individuals, environment, etc.
Epidemic control	 Control access to site and enforce epidemic control measures Disinfect and eliminate risk factors in the environment
Administrative support	 Manage data (organization, etc.) Manage information regarding patients and contacts

B. Determining the Scope and Method of Isolation and Quarantine

 Determine the scope and method of isolation and quarantine in healthcare facilities requiring intensive management based on the Risk Assessment Criteria performed by the Immediate Response Task Force

Division	Risk assessment criteria
Confirmed case	 What is the degree of infectivity (viral load, signs and symptoms) of the patient? Whether or not PPE was used by the patient (estimation of viral shedding) Taking the patient's activity levels into consideration, their location history, and their length of admission (stay), what was the (spatial) scope of contact?
Exposed contacts	 What is the extent and number of contacts, such as other patients, family members, caregivers, and medical personnel? What is the underlying health conditions and acuity level of exposed patients and patients currently admitted in the facility?
Healthcare facility	 Taking into account the available facilities, treatment capability, and management situation, what are the vulnerabilities of the healthcare facility? The distance from the patient room, its accessibility, and whether the floor shares air conditioning facilities with that room

C. Decision to Close off All or Part of the Healthcare Facility

- Rule: The Central or the Municipal/Provincial Immediate Response Task Force determines closure of healthcare facilities and its degree
- Items to review:
 - Immediate temporary closure is considered first for small-scale facilities (clinic level) among healthcare facilities with patient traffic
 - For healthcare facilities with high number of confirmed cases and/or contacts, consider **partial** closure if a large number of contacts require medical care from the healthcare facility

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- If partial closure measures such as continued operation of specific clinics or emergency room are in effect, segregate routes taken by cases and suspected cases, healthcare providers, and areas
- To determine the degree of closure, first establish the space representing the absolute maximal extent of exposure and potential exposures and then reduce its range based on the results of investigations (start at maximal extent, confirm exposure status, risk assessment and suspension of closure; stepwise elimination)

D. Designation as an Intensive Management Healthcare Facility

- **Purpose**: Minimize occurrence of additional COVID-19 confirmed cases and community spread, as well as to block the transmission path associated with healthcare facilities
 - Utilize existing infrastructure (facilities, equipment, personnel, etc.) of healthcare facilities with an outbreak of confirmed cases and focusing infection control capability, designate the healthcare facility as an intensive management healthcare facility that isolates and provides medical care to confirmed cases and contacts
- **Designation and notification**: Governor of the Municipality or the head of City/County/District with jurisdiction over the healthcare facility decides designation, and the same party should notify the healthcare facility of that designation
- Management: A combination of the Municipal Task Force Headquarters, City/County/District Task Force Headquarters, and healthcare facility officials should manage the Intensively Managed Healthcare Facility, with the Municipal Task Force Headquarters (or the Epidemic Control Officer from the Immediate Response Task Force, as needed) overseeing the operation
- **Quarantine procedures**: Quarantined area is based on where confirmed cases have arisen, and includes the ward, floor, patient room, etc., taking into account the movement history of the confirmed case, air conditioning systems, treatment status, and the healthcare facility's infection control capacity

E. Management of the Intensive Management Healthcare Facility

1) Prioritization of risk factor control measures

- Isolation of confirmed cases: After taking infection control measures*, report to Local Public Health Center or Municipal COVID-19 Patient Management Task Force (report immediately if patient transfer is required due to worsening clinical status during the treatment process) to categorize for clinical acuity and facilitate bed allocation
 - * Single-patient room isolation, on-site control of traffic in areas visited by the patient, usage of PPE by healthcare providers
 - * Transfer of confirmed cases is possible prior to site evaluation
- **Healthcare facility access and investigation**: Immediately after taking measures such as closure of the healthcare facility (entirely or partly), control access to the healthcare facility from both inside and outside, launch an epidemiological investigation, and begin investigating close contacts (supported by law enforcement if necessary)
- Primary epidemic control measures: After a confirmed case is identified and immediately isolated, perform an epidemiological investigation* of potential intra-facility exposure and organize primary epidemic control measures, such as disinfection of all surfaces in areas of the facility that were exposed

* If it is important to investigate the source of infection, do so after sufficiently conducting investigations such as environmental specimen collection under the supervision of the Epidemic Control Officer

2) Principles of quarantine for close contacts

- Relocate exposed close contacts (patients, healthcare providers, caregivers and guardians, etc.) depending on the presence of symptoms and medical necessity, minimizing movement of close contacts as much as possible
- For patients requiring admission, follow the principle of one patient per room in the applicable healthcare facility

However, if necessary, apply this principle in a way that minimizes the spread of infection, such as cohort zone quarantine, taking into account the ward structure and infection control capabilities of the healthcare facility.

- If transfer to another healthcare facility is required, transfer patients to designated facilities depending on the number of patients requiring transfer (refer to section H: Miscellaneous)
- If possible, healthcare providers assigned to quarantined areas of the healthcare facility should discontinue providing care in other areas of the hospital
- Suspend new patient admissions to wards in quarantined areas of the healthcare facility
- If close contacts have any suspected symptoms (fever or respiratory symptoms), immediately classify as suspected cases and isolate
- Monitor quarantined patients for development of symptoms (fever, respiratory symptoms, etc.) at least twice daily and report findings to the public health center (to be reviewed by public health center in jurisdiction where healthcare facility is located)

3) How to quarantine close contacts within the healthcare facility

- Quarantine close contacts, taking into account areas that confirmed patient has visited, location history, and capabilities of healthcare facility
- Implement intensive management until all individuals are released from quarantine
- Healthcare providers responsible for the quarantined area should enter and exit area with appropriate PPE (Table 1) to avoid the possibility of disease transmission between close contacts

□ Principles of bed allocation

- Allocate single-patient negative pressure rooms to prevent mixing and circulation of air from isolation rooms with confirmed cases to other areas within the healthcare facility
- When no negative pressure rooms are available, prevent mixing and circulation of air from isolation rooms to other areas within the healthcare facility as best as possible
- Air conditioning standards: Because the default is to mix outside air (30%) and inside air (70%), adjust the opening rate of air conditioning facilities to source 100% outside air in order to prevent recirculation of inside air
- If there are no single-patient rooms available, shared patient rooms may be used for confirmed cases in a ward completely separated from general patient traffic
- In principle, a negative pressure single-patient room is required for suspected cases until testing results are available, but they may be admitted in a regular single room that meets the air conditioning standards specified above
- Priority for negative pressure bed allocation of high-risk patients should go first to patients who require medical procedures
 - Priority of bed allocation for high-risk patients
 - Patients with oxygen saturation less than 90% who require initial oxygen treatment
 - Patients 65 years or older
 - Patients with underlying health conditions (chronic obstructive pulmonary disease, cardiovascular disease, etc.)

Example of bed allocation for confirmed cases

- 1) Allocate each confirmed patient to a negative pressure single-patient room
- 2) If no negative pressure single-patient room is available, allocate confirmed case to negative pressure shared-patient room
- 3) If no negative pressure shared-patient room is available, allocate patient to regular single-patient room
- 4) If no regular single-patient room is available, admit to a regular shared room (* 3 meters interval between beds is not required)
- 5) If no regular shared room is available, use the entirety of a single floor of the facility
- 6) However, admit severely ill patients to KCDC-certified negative pressure single-patient isolation rooms
 - Negative pressure beds distributed among university hospitals
- Conditions for 3), 4), 5)
- Movement: Because movement between general patients and confirmed patients should be completely separated, when a confirmed patient is admitted to a regular hospital room, the entire ward (or floor) must be operated independently
- Air conditioning standards: Because the default is to mix outside air (30%) and inside air (70%), adjust the opening rate of air conditioning facilities to source 100% outside air in order to prevent recirculation of inside air

4) Management of exposed patients and healthcare providers within healthcare facility

- After testing for COVID-19, isolate individuals who test positive; if individuals who had tested negative exhibit symptoms, re-test them
- Quarantine of exposed patients:
 - For all exposed patients in the quarantined area → director of Local Public Health Center will issue a "Notice of quarantine" to quarantined individuals
 - Although protocol indicates quarantining in single patient rooms, use quarantine measures such as cohort quarantine to minimize infection transmission, depending on the situation of each healthcare facility
 - Limit new patient admissions and visitors to quarantined areas
 - Every person staying in a quarantined area must wear a mask
 - Monitor quarantined individuals for fever or respiratory symptoms 2 times per day
 - Request COVID-19 test for quarantined close contacts exhibiting respiratory symptoms; isolate individuals in negative pressure room or single-patient room on the ward (to be determined by the Municipal COVID-19 Immediate Response Task Force) until test result becomes available
 - Transfer confirmed cases to facilities capable of providing treatment (nationally-designated inpatient beds, designated or general hospitals)

• Quarantine of healthcare providers and other staff:

- Applies to all healthcare providers and staff that provide medical care in the areas visited by the confirmed patient
- Asymptomatic healthcare providers and staff with a history of close contact with the confirmed patient should self-quarantine
- Quarantine separately from patients
- Prior to entering quarantined areas and providing patient care, healthcare providers must adhere to strict hand hygiene and wear PPE*
- * Refer to Table 1 for COVID-19 PPE Recommendation by Situation and forms of exposure; Refer to Table 2 for Work standards for healthcare provider who have had contact with COVID-19 patients and suspected patients
- Minimize all other medical care (outpatient, consulting, etc)
- If symptoms arise, isolate the individual in a negative pressure isolation room until test results are determined
- If confirmed positive, transport the confirmed patient to nationally-designated inpatient bed for treatment
- Wear PPE while providing medical care for the confirmed case prior to their transfer
- Close contact quarantine release criteria:
 - Test close contacts (patients or healthcare worker) of the confirmed case on their 13th day of quarantine (COVID-19 PCR Testing); upon confirmed negative, release the subject from quarantine after end of 14th day and conclude monitoring
 - * Example: If the last date of contact is April 1st, the day after the end of the 14th day of quarantine is April 16th, upon which quarantine release is possible
 - At the time of quarantine release, the healthcare facility must check former case for fever or respiratory symptoms; if symptoms are present, possibly extend the quarantine at the discretion of those in charge, such as the director of the Local Public Health Center
 - If case develops fever or respiratory symptoms after quarantine release, re-quarantine is

possible at the discretion of those in charge, such as the director of the Local Public Health Center

- Management of quarantined subjects:
 - The director of the public health center in the jurisdiction where healthcare facilities are located issues a "Notice of Isolation/Quarantine" to quarantined subjects
 - * Share Notice details with public health center that has the jurisdiction over the quarantined subject's residence
 - Healthcare facility should monitor quarantined subjects for fever, respiratory symptoms, etc. more than twice per day and submit the results to the Local Public Health Center that has the jurisdiction over the healthcare facility (results examined by public health center)
 - * Share results with public health center that has the jurisdiction over the quarantined subject's residence
 - The day before releasing a subject from quarantine, the healthcare facility should inform the Local Public Health Center of the quarantine release
- Status reports on operations of healthcare facilities under intensive management:
 Healthcare facility under intensive management:
 - Report daily to Local Public Health Center of major matters such as the status of the quarantined subjects, occurrence of fever or respiratory symptoms, status of tests used for quarantine release, status of site management personnel, and more
 - Report immediately if there is a confirmed case, need for urgent action, or need for central policies
 - If a quarantine release is decided, notify the Local Public Health Center in advance
 - Public health center of the healthcare facility's location: After receiving the status of the quarantined subjects from healthcare facilities, enter the information into the close contact management system
 - * Note: record the address of the quarantined subject as the address of the healthcare facility, and record the residence address of the quarantined subject in a separate way

F. Release of Healthcare Facilities under Intensive Management

- Release decision: If there are no additional confirmed cases within the facility and the quarantine period for all close contacts in the quarantined area have elapsed, the Municipal Countermeasures Headquarters (Central COVID-19 Immediate Response Task Force, if necessary) shall decide whether to release the healthcare facility under intensive management
 - If release is decided, the local public health center shall inform the corresponding healthcare facility of this decision

G. Resuming Patient Care

- Healthcare facilities can resume medical care in non-quarantined areas such as outpatient, wards, and emergency rooms. For quarantined areas, plan and implement infection control measures prior to resuming medical care, in compliance with 'Healthcare Facility Infection Control Guidelines'
 - The municipality confirms the healthcare facility's plans and implementations for infection control and corrective measures, and determines if medical care can resume

* Workers in the healthcare facility who are in isolation or quarantine should not work during the isolation / quarantine period. Confirm that disinfection of the quarantined area has been completed, and confirm the infection control measure plans and implementations

 In case of a full closure, following control measures and depending on the exposure assessment, it is possible to modify to a partial closure and partially resume medical care

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 Take various factors into account when considering resuming medical care, including the time of disinfection of the areas exposed to confirmed cases, as well as air exchange rates informed by ventilation requirements (the number and location of windows, weather, etc.)

Reduction of droplet nuclei concentration according to ventilation frequency, ventilation rate, and air exchange rate¹

▼ Under natural ventilation, air exchange rate and ventilation rate								
Degree of opening	Air exchange rate (ACH)	Ventilation rate (L/s)						
Open Window (100%) + Open Door	37	1300						
Open Window (50%) + Open Door	28	975						
Open Window (100%) + Closed Door	4.2	150						

▼ Reduction of drop nuclei concentration, measured by ventilation rate and time									
		Air exchange rate (ACH) (%)							
Time (s)	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

(Assumptions: wind speed 1m/s, room dimensions 7m long x 6m wide x 3m tall, window 1.5 x $2m^2$, door 1 x $2m^2$ x $2m^2$)

Setting the average half-life of the coronavirus as 30 minutes - 1 hour², with the condition that air changes 12 times per hour, less than 1% of the air remains after 30 minutes³

H. Other

- 1) Prepare a resource mobilization plan to prepare for shortage of healthcare facility personnel
 - Each municipality or region should train and prepare physicians and nurses for potential deployment

* Include expert groups in each region: infectious diseases internists, infectious diseases nurses, etc

¹ Natural Ventilation for Infection Control in Health-Care Settings, WHO, 2009

² Stability of Middle East respiratory syndrome coronavirus (MERS-CoV) under different environmental conditions, Eurosurveillance Weekly, 19 September 2013

³ Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health-Care Settings, 2005 MMWR December 30, 2005 / Vol. 54 / No. RR-17

** Priority Order: medical personnel for nearby general hospitals and public medical facilities - medical personnel for military medical facilities - medical personnel for public health centers

- 2) Plan for patient transfer to other healthcare facilities
- 3) Request for cooperation with related authorities to secure isolation beds and supplies
- 4) Place security personnel in cohort quarantine areas to provide thorough explanations for patients and families
- 5) Strengthen infection prevention and management in healthcare facilities
- Conduct thorough infection control and management by referring to COVID-19 Healthcare Facility Infection Prevention and Management Guidelines (Hospital Grade Healthcare Facility)
- All employees undergo training for COVID-19 infection prevention and management, comply with the infection prevention and management rules, and monitor them

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

		PPE							
	R	espiratory protec	tion		Eye protection				
Situation / activity	Surgical mask	KF94 or equivalent	Electronic respirator	Disposable gloves⁴	Disposable waterproof long-sleeved gown	Coveralls (including shoe covers)	Goggle/ face shield		
POE screening (epidemiological investigation)		•		•		•	•		
Screening center reception desk		•		•	•				
Screening center administrative staff		•		•	•				
Screening center clinical staff		•		•	•		•		
Transport (ambulance driver) ⁵		•		•					
Transport (quarantine officer, PHC personnel, EMT, etc.)		•		•	•		•		
Ambulance disinfection		•		•		•	•		
Suspected patient care: entering room, evaluating, and nursing		•		•	•		•		
Aerosol-inducing procedures ⁶				•	•		•		
Examination: X-ray and other imaging				•	•		•		
Respiratory specimen collection				•	• •		•		
Specimen handling (laboratory, exam room,		•	•	•)	•		

⁴ Double-glove while examining, treating, nursing, testing, or cleaning around suspected or confirmed positive patients to mitigate the risk of exposure from glove perforation.

⁵ If driving an ambulance without a barrier separating the driver seat from the patient compartment, wear a full-body suit, shoe cover, KF94-equivalent respiratory protection equipment and gloves, and wear goggles/face shield if necessary.

⁶ Aerosol-generating procedures include endotracheal intubation, cardiopulmonary resuscitation, bronchoscopy, aspiration of airway secretions, tracheostomy care, autopsy, non-invasive continuous positive air pressure, nebulizer therapy, and procedures involved in sputum induction

etc.) ^{7,8}						
Specimen transport (in intact package)			•			
Dead body transport		•	•		•	
Patient room cleaning and disinfection		•	•	•		•
Healthcare waste disposal and handling		•	•	•		•
Healthcare waste transport	•		•	•		

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

⁸ Wear a long-sleeved gown and disposable gloves while working on a Class II biosafety workbench

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

⁷ In specimen-handling labs or exam rooms, refer to guidelines from the KCDC Biological Safety Board for PPE choice, use, and maintenance

Table 2. Work standards for healthcare provider who have had contactwith COVID-19 patients and suspected patients

Epidemiological risk factors	Level of exposure	Recommended monitoring	Work limit for symptomatic healthcare provider
 1) Healthcare provider performing a medical procedure without PPE (unprotected eyes, nose or mouth)¹⁾ or otherwise present in the same space during such procedures → Procedures likely to produce more concentrated respiratory droplets or aerosols (e.g. cardiopulmonary resuscitation, intubation, extubation, bronchoscopy, nebulizer therapy, sputum induction) 	High	By a health facility/agency	14-day suspension from work since the last contact date
 2) Healthcare provider performing aerosolizing procedures without a gown or gloves, or otherwise present in the same space during such procedures → Procedures likely to produce more concentrated respiratory droplets or aerosols (e.g. cardiopulmonary resuscitation, intubation, extubation, bronchoscopy, nebulizer therapy, sputum induction) Note: Classify as (1) if the healthcare provider's eyes, nose or mouth were not protected during aerosolizing procedures 	Medium	By a health facility/agency	14-day suspension from work since the last contact date
 3) Healthcare provider without PPE (unprotected eyes, nose or mouth)¹⁾ → Close contact with a patient not wearing a mask Note: Applicable to unprotected eyes during close contact with a patient not wearing a mask 	Medium	By a health facility/agency	14-day suspension from work since the last contact date
4) Healthcare provider without PPE (unprotected eyes, nose or mouth) ¹⁾ \rightarrow Close contact with a patient who wearing a mask	Medium	By a health facility/agency	14-day suspension from work since the last contact date
 5) Healthcare provider without gloves and unable to practice immediate hand hygiene → Direct contact with a patient's secretions/excreta Note: Classify as low risk if hands were washed immediately after contact 	Medium	By a health facility/agency	14-day suspension from work since the last contact date
 6) Healthcare provider wearing a mask → Close contact with a patient wearing a mask 	Low	Self-monitoring	-
7) Healthcare provider wearing all recommended protective equipment (e.g. respirators, eye protection, gloves and gowns) \rightarrow Close contact with or handles a patient's secretions/excreta	Low	Self-monitoring	-
 8) Healthcare provider without recommended protective equipment (see Table 3: Standards for Hospital Staff PPE) → Simple interactions* with a patient *Entering a patient's room without physical contact, etc. 	Low	Self-monitoring	-

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9) Healthcare provider with neither direct contact with patients nor patients' secretions/excreta, and no entry to patient rooms	No risk	-	-
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* Monitor up to 14 days after the last potential exposure

1) When PPE is not worn on the designated parts of the body

Attachment 1. Environmental Disinfection Method

- 1. Staff Performing Environmental Cleaning and Disinfection
 - 1) Education: Employees responsible for cleaning or disinfection should receive training on infection prevention.
 - Personal Protective Equipment (PPE): Employees who are cleaning or disinfecting an area should wear PPE (respiratory protective equipment with grades equivalent to or above N95, full body protective suit or an apron with long sleeves, goggles or a face shield, shoe covers or rubber boots, double-gloves (outer gloves should be rubber)

2. Environmental Cleaning and Disinfection Protocols

- 1) Use mop soaked in cleaning solution or disinfectant solution, rather than a broom or vacuum cleaner, in order to prevent spraying of pathogens into the air
- 2) Wipe down surface areas before environmental disinfection, as organic matter on surfaces can hinder proper disinfection.
- 3) Thoroughly wipe all non-permeable surfaces (including ceilings and lights) using disposable towels or mop soaked in 0.1% sodium hypochlorite (1,000ppm) or equivalent environmental disinfectant
- 4) All permeable surfaces should be replaced if possible or immersed in disinfectant solution
- 5) Use disposable cleaning tools when possible, or use a set of cleaning tools dedicated to disinfection. If reusing a cleaning tool, it should be sterilized using the appropriate disinfectant and dried before storing
- 6) After disinfection, ventilate for a minimum of two hours (air exchange rate of at least 6 times per hour) with consideration for contamination level. Review checklist to ensure completion of disinfection.

3. Types of Disinfectants and Use

- Disinfectants used in healthcare facilities include sodium hypochlorite (1000ppm recommended^{9 10 11}) and alcohol (for contaminated surfaces), and disinfectants proven to work on viruses can be used
 - * Sodium hypochlorite, alcohol, phenolic compounds, quaternary ammonium compounds (QACs), and peroxygen compounds are appropriate environmental disinfectants. H_2O_2 vapor, H_2O_2 dry mist, etc. can also be used*

* For safety, these should be deployed by properly trained users, strictly complying with manufacturer guidelines

- When using sodium hypochlorite, check the concentration of commercially available bleach. Dilute to an effective concentration level of 0.1% or 1,000ppm (for a 5% bleach concentration, dilute 20ml of sodium hypochlorite with 1000ml of water).
- When using disinfectants, follow the manufacturer's recommendations on dilution ratio, contact duration, and handling precautions

⁹ Best Practices for Environmental Cleaning in Healthcare Facilities: in Resource-Limited Settings (Ver. 1), 2019

¹⁰ Novel coronavirus (2019-nCoV) Guidance for primary care Management of patients presenting to primary care Version 5.0, 2020, NHS

¹¹ Novel coronavirus (2019-nCoV) infection prevention and control guidance Updated 3 February 2020. PHE

Attachment 2. Inpatient Treatment Methods and Procedures during Hospital Isolation

Basis: Article 41 (Management of Patients with Infectious Diseases) of the *Act on the Prevention and Management of Infectious Diseases*; Enforcement Decree of the same Act, Article 23 (Annex 2: Methods and Procedures for Self- and Inpatient Treatment)

Inpatient treatment method for hospital isolation

- For non-respiratory infectious diseases, the patient shall be isolated in a single patient room (equipped with sink and toilet) at a healthcare facility designated by the Infectious Disease Control Institutions or the government authority (governor of a municipality/city/county/district). However, if it is difficult to accommodate inpatient treatment in a single patient room, conduct joint isolation with patients of the same disease or patients with a low risk of re-infection.
- For respiratory infectious diseases, the patient shall be isolated in a single patient room at a healthcare facility designated by the Infectious Disease Control Institutions or the government authority (governor of a municipality/city/county/district). The single patient room should be equipped as a negative pressure room with closed doors and have independent air circulation. If a negative pressure room is not available, the patient shall be hospitalized in a separate facility. If it is difficult to accommodate care in a separate facility, conduct joint isolation with separation measures taken to prevent transmission of respiratory diseases to other patients.
- Restrict patients from leaving the room and limit transfers during the treatment period.
- Thoroughly manage patient secretions and excrement, and disinfect contaminated items.
- Minimize access to the treatment room, including for healthcare workers. Visitors must wear personal protective equipment such as disposable gloves, and appropriate measures such as hand hygiene should be taken to prevent the spread of infectious disease.
- Medical equipment used for patient care should be disposed of after each use if they are disposable, and items that are not suitable for single use, such as thermometers, should be used exclusively for the same patient.

Inpatient treatment procedure for hospital isolation

- Upon patient admission to the inpatient treatment facility, the medical personnel (who examines or diagnoses the patient), the head of the healthcare facility, or the infectious disease management agency shall immediately report to the director of the local public health center.
- Upon receiving the report, the public health center director should promptly verify and confirm the inpatient treatment case.
- The duration of inpatient treatment is defined from the time the patient tested positive until all symptoms are resolved and the patient is no longer infectious.
- The head of the healthcare facility and medical personnel shall declare the end of inpatient treatment for patients who can be discharged, and should immediately report this to the director of the local public health center. The director of the public health center shall promptly confirm the patient discharge.
- Asymptomatic patients who are still considered infectious should continue to be treated under the care
 of the public health center, and he/she shall receive inpatient treatment or conduct self-treatment at
 home until he/she is no longer deemed infectious.

Form 1. Municipal Headquarters Daily Report Form (for Healthcare Facilities)

Facility (Location) Name:

Date/time		Body temperature	Re (cough,	spiratory , sore thr	/ sym oat, r	ptoms unny nose)	Isolation/c comp	uarantine liance	Special comments		
(/)	□ AM	C°	None	□ Yes	()	□ Yes	□ No	
			□ PM	C°	None	□ Yes	()	□ Yes	□ No	
(/)	□ AM	C°	None	□ Yes	()	□ Yes	□ No	
			□ PM	°C	None	□ Yes	()	□ Yes	□ No	
(/)	□ AM	°C	None	O Yes	()	□ Yes	□ No	
			□ PM	°C	None	O Yes	()	□ Yes	□ No	
(1)	□ AM	C°	None	O Yes	()	□ Yes	□ No	
			□ PM	S°	None	Yes	()	□ Yes	□ No	
(/)	□ AM	°C	None	□ Yes	()	□ Yes	□ No	
			□ PM	°C	None	□ Yes	()	□ Yes	□ No	
(1)	□ AM	S°	None	Yes	()	□ Yes	□ No	
			□ PM	S°	None	Yes	()	□ Yes	□ No	
(/)	□ AM	C°	None	□ Yes	()	□ Yes	□ No	
			□ PM	C°	None	□ Yes	()	□ Yes	□ No	
(/)	□ AM	C°	None	□ Yes	()	□ Yes	□ No	
			□ PM	C°	None	□ Yes	()	□ Yes	□ No	
(/)	□ AM	°C	None	□ Yes	()	□ Yes	□ No	
			□ PM	°C	None	□ Yes	()	□ Yes	□ No	
(/)	□ AM	°C	None	□ Yes	()	□ Yes	□ No	
			□ PM	°C	None	□ Yes	()	□ Yes	□ No	
(/)	□ AM	C°	None	□ Yes	()	□ Yes	□ No	
			□ PM	°C	None	□ Yes	()	□ Yes	□ No	
(/)	□ AM	°C	None	□ Yes	()	□ Yes	□ No	
			□ PM	°C	None	□ Yes	()	□ Yes	□ No	

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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