

Nepal Medical Council Interim Guidance for Infection Prevention and Control When COVID-19 Is Suspected

NEPAL MEDICAL COUNCIL

(APRIL 5, 2020)

PREPARED BY:

NEPAL MEDICAL COUNCIL COVID-19 TREATMENT GUIDANCE COMMITTEE

SUPPORTED BY:

NEPAL MEDICAL ASSOCIATION
SOCIETY OF INTERNAL MEDICINE OF NEPAL
NEPALESE SOCIETY OF CRITICAL CARE MEDICINE
GENERAL PRACTITIONERS ASSOCIATION OF NEPAL
NEPAL DENTAL ASSOCIATION

Nepal Medical Council

Interim Guidance for Infection Prevention and Control When COVID-19 Is Suspected

I. PURPOSE OF THE GUIDELINES

The purpose of this document is to help physicians, nurses, other healthcare workers and healthcare institutions to apply appropriate principles of Infection Prevention and Control while providing care in healthcare institutions for patients with suspected or proven COVID-19. COVID-19 (Coronavirus Infectious Disease 2019) is a respiratory tract infection caused by the betacoronavirus SARS CoV-2 (SARS coronavirus type-2). These guidelines are based on current knowledge in the available literature, expert consultations, and recommendations from WHO, CDC and other authorities. These guidelines are not meant to replace clinical judgment based on individual patient needs and do not exclude expert consultation and are subject to change based on new knowledge.

II. TRANSMISSION CHARACTERISTICS OF COVID-19

Person-to-person transmission of COVID-19 occurs mainly through respiratory droplets released when an infected person coughs, talks or sneezes, and through contact with contaminated surfaces followed by touching one's eyes, nose or mouth. In experimental conditions, viable SARS-CoV-2 virus was detected on different types of surfaces for up to 2-3 days, and in aerosols up to 3 hours after aerosol-generating procedures. However airborne transmission is not thought to be a major driver of transmission. The virus has also been detected in blood and feces of infected patients. However, fecal-oral route does not appear to be a driver of transmission.

The incubation period has been reported to be 2-14 days (mean 5-6 days). The median time from the onset of symptoms to recovery in patients of COVID-19 is approximately 2 weeks for mild cases and 3-6 weeks for severe or critical cases. The infected individuals are generally considered to be potentially infectious while they are symptomatic. Transmission of the virus from asymptomatic individuals has been described however it is unclear how frequently it occurs.

III. ORGANIZATIONAL PREPAREDNESS FOR PREVENTING AND CONTROLLING COVID-19

Each healthcare facility should adopt measures that facilitate

- Early assessment / triaging of cases of COVID-19
- Early identification / reporting of cases of COVID-19
- Education of staff, patients and visitors about standard and transmission-based infection control precautions
- Implementation of transmission-based precaution measures
- Restriction of access to ill visitors
- Implementation of sound occupational health policies for pre- COVID-19-surge and surge settings

Please refer to separate Clinical Management Guidelines for COVID-19 by the Nepal Medical Council for recommendations in triaging and early identification of COVID-19 cases.

IV. INFECTION PREVENTION AND CONTROL PRECAUTIONS

1. STANDARD INFECTION CONTROL PRECAUTIONS

Standard infection control precautions include the basic measures such as hand hygiene, respiratory hygiene, appropriate environmental cleaning, proper waste management, etc. that should be used by all staff at all times for all patients. They are by far the most effective protection against COVID-19 infection, more so than contact and droplet transmission precautions. Standard precaution measures are the only measures that will protect from transmission from asymptomatic or pre-symptomatic carriers of SARS-CoV-2.

Healthcare facilities should ensure that their healthcare providers and other staff members have access to handwashing facilities with adequate clean water and soap, or given adequate supplies of alcohol-based hand sanitizers.

All staff should be trained on the appropriate methods for hand-washing and using alcohol-based hand sanitizer. All staff should be advised to perform hand hygiene strictly, as advised in WHO's "my 5 moments of hand-hygiene" approach.

- Before touching the patient
- Before clean / aseptic procedures
- After body fluid exposure risk
- After touching the patient
- After touching the patient's surroundings

Good respiratory and cough hygiene measures should be adopted by all staff, patients and visitors. These include cleaning hands using soap and water after coughing, sneezing, and wiping or blowing the nose, keeping hands away from eyes, mouth and nose.

2. TRANSMISSION BASED PRECAUTIONS

For patients known or suspected to be infected with SARS-CoV-2, additional measures need to be implemented. These are

- Contact precautions
- Droplet precautions
- Airborne precautions (for aerosol generating procedures)
- Medical staff will follow droplet and contact precaution guidelines (surgical mask, goggles or face visor, gown, gloves) while assessing or managing the patient, with additional airborne precautions (N-95 masks) for aerosol-generating procedures.

Aerosol-generating procedures include:

- Cardio-pulmonary resuscitation
- Intubation, extubation and related procedures
- Manual ventilation
- Tracheostomy / tracheostomy procedures
- Bronchoscopy
- Open suctioning
- Non-invasive ventilation

- Nebulization therapy (“Dry nebulization” is a non-aerosol-generating alternative. See appendix 1)
 - High flow nasal oxygen
 - Sputum induction
 - Obtaining nasopharyngeal or oropharyngeal swab
 - Dental procedures
 - Otorhinolaryngology procedures
 - Upper gastrointestinal endoscopy
- For patients with suspected or confirmed COVID-19, these potentially aerosol-generating procedures should only be performed when essential.
- Patients should be placed in adequately ventilated single rooms, and where available, preferably in rooms with negative pressure with the air in the room delivered directly to the atmosphere (unilateral laminar flow - See appendix 2), or recirculated into the building after filtration through high-efficiency particulate air (HEPA) filters with minimum of 12 air exchanges per hour. When negative pressure rooms are not available,
 - When single rooms are not available, patients with confirmed COVID-19 should be grouped together. Their beds should be placed at least 2 metres apart.
 - If possible, suspected (but not confirmed) patients with COVID-19 should not be cohorted with other patients with suspected or confirmed COVID-19.
 - Each single-patient isolation room should have the following instruments for each patient:
 - Stethoscope (dedicated to the patient)
 - BP cuff (dedicated to the patient)
 - Thermometer (dedicated to the patient)
 - Surgical masks, plus goggles or visors or face shields (reusable after disinfection)
 - Non-sterile gloves
 - Disposable gowns, or clean reusable gowns made of water-resistant fabric
 - Receptacle (bin) for waste disposal
 - If more than one patients with suspected COVID-19 are placed in one room, each individual patient should have dedicated equipment from the list above, except for waste bin.
 - If equipment needs to be shared between patients, they should be cleaned and disinfected between use for each individual patient.
 - Hospitals should implement staffing policies to minimize the number of healthcare providers who enter the room. They should consider providing care for these patients with dedicated providers (not more than one doctor and one nurse for a patient during a shift if possible) to minimize risk of transmission and exposure to other patients and other healthcare providers.
 - Hospitals should keep a log of all persons who care for or enter the rooms or care area of these patients.
 - Standard precautions should be applied at all times. Additional contact and droplet precautions should continue until:
 - At least 3 days after resolution of fever without use of antipyretic medication **and** resolution of respiratory symptoms
 - At least 7 days have passed since the first symptoms appeared
 - Negative results for COVID-19 in at least 2 nasopharyngeal swab specimens collected \geq 24 hours apart.

V. PERSONAL PROTECTIVE EQUIPMENT (PPE) WHILE TAKING CARE OF SUSPECTED COVID-19 PATIENTS

1. All healthcare providers and other staff should have access to appropriate personal protective equipment for them to carry out their professional work. (See below and on Appendix 4 for list of appropriate PPEs)

As noted in the Nepal Medical Council's Professional Ethics Guidelines for COVID-19 (March 2020), the country and the healthcare institutions have an obligation to provide necessary equipment including appropriate Personal Protective Equipment (PPE) to the healthcare workers (HCWs) for their personal protection as well as to minimize transmission of infection between infected and non-infected individuals.

2. All staff should be trained on the appropriate methods for putting on and removing ("donning" and "doffing") PPE, including leak test for N-95 masks. (See poster in Appendix 3)
3. The general principles that help determine the types of PPE is appropriate settings are as follows:
 1. N-95 masks for aerosol generating procedures
 2. Eye-cover and gown, with or without head or foot cover, when having direct contact with patients or when risk of splash of secretions
4. All patients with suspected COVID-19 should be given surgical masks as soon as they arrive at the facility and asked to put them on throughout their stay in the hospital until 2019-SARS-CoV-2 acute respiratory disease is ruled out, unless they are placed in a negative pressure room.
5. When supplies of N-95 masks are severely limited during a pandemic, hospitals should implement:
 - staffing policies aimed at minimizing the number of individuals needing N-95 masks
 - allowing extended use and/or limited reuse of N-95 masks, when acceptable
 - prioritize the use of N-95 for the staff members at the highest risk of acquiring the infection or risk of having serious complications from it.

When severe scarcity of N-95 masks is expected, the following protocol is suggested.

After using N-95 for the first time:

1. Get a clean paper bag and write your name on it.
2. Perform hand hygiene before removing the N-95 mask.
3. Take the N-95 out safely without touching the inner surface of the mask.
4. Keep the mask in a clean paper bag and staple the open end.

Reusing N-95 masks

1. Wash your hands or use hand sanitizer.
2. Tear the paper bag open.
3. Take out the N-95 mask and put it on.
4. Dispose of the paper bag.
5. Perform hand hygiene.
6. When removing the N95 mask, again use the process above and keep the mask safely in a new paper bag.

Note:

1. N-95 mask can be reused until it is physically damaged or soiled
2. DO NOT clean N-95 masks with alcohol, chlorhexidine or any other chemicals
3. Always use an N-95 mask along with goggles or face shield.
4. While doing airway procedures, cover the N-95 mask with a surgical mask (which will be discarded later) to protect it from getting soiled
5. N-95 mask must only be used by a single user.

6. PPE for healthcare workers involved in aerosol-generating procedures:

- a. N-95 mask
- b. Goggles or face-shield
- c. Gloves (double layer) (non-sterile)
- d. Disposable gowns, or clean reusable gowns made of water-resistant fabric
- e. Cap (regular disposable)

Airborne precautions with N-95 mask should be continued for at least 3 hours in the room after an aerosol-generating procedure is performed, unless it is performed in a negative-pressure room, where airborne precautions can be discontinued after 1 hour (while droplet and contact precautions are continued).

7. PPE for healthcare workers providing routine care in hospitals, including those at “Fever/Influenza-like Illness Clinic”:

- a. Surgical mask (seal the top edge with tape)
- b. Goggles or face-shield
- c. Gloves (non-sterile)
- d. Disposable gowns, or clean reusable gowns made of water-resistant fabric
- e. Cap (regular disposable)

Those only collecting personal identification information or demographic or triage questionnaire data should maintain a distance of minimum 2 metres from the patient.

8. PPE for escorts in hospitals or drivers of ambulances or transport vehicles:

- a. Surgical masks
- b. Gloves (non-sterile)
- c. If physical contact is expected, depending on circumstances, a gown PLUS goggles or face-shield are also recommended, otherwise need to maintain minimum 2 metres distance from the patient.
- d. The patient should be given surgical mask and instructed to perform hand-hygiene.

9. PPE for laboratory staff processing specimen from suspected COVID-19 patients:

- a. Surgical masks
- b. Disposable gowns, or clean reusable gowns made of water-resistant fabric
- c. Gloves (non-sterile)
- d. Goggles or face-shield (if risk of splash)

- e. Cap, disposable (if risk of splash)

10. PPE for staff handling linens, waste and dead body:

- a. Surgical mask (seal the top edge with tape)
- b. Goggles or face-shield
- c. Heavy duty gloves
- d. Disposable gowns, or clean reusable gowns made of water-resistant fabric
- e. Cap (regular disposable)
- f. Boots or closed work shoes

11. PPE for all other staff (including health care workers involved in any activity that does not involve contact with suspected or confirmed COVID-19 patients and working in other areas of patient transit such as wards, corridors):

- NO PPE is required
- Standard precautions including hand hygiene should be strictly followed.
- Maintain spatial distance of at least 2 metres.

VI. MANAGEMENT OF VISITORS

- Restrict visitors from entering the room of known or suspected COVID-19 patients. Alternative mechanisms for patient and visitor interactions, such as video-call applications on cell phones or tablets should be explored.
- Hospitals can consider exceptions based on end-of-life situations or when a visitor is essential for the patient's emotional well-being and care.
- Hospitals should provide instruction, before visitors enter patients' rooms, on hand hygiene, limiting surfaces touched, and use of PPE according to current facility policy while in the patient's room.
- Hospitals should maintain a record (e.g., log book) of all visitors who enter patient rooms.
- Visitors should not be present during aerosol-generating procedures.
- Visitors should be instructed to limit their movement within the facility.
- Exposed visitors (e.g., contact with a symptomatic COVID-19 patient prior to admission) should be advised to report any signs and symptoms of acute illness to their health care provider for a period of at least 14 days after the last known exposure to the patient.
- All visitors should follow respiratory hygiene and cough etiquette precautions while in the common areas of the facility.

VII. MANAGEMENT OF THE EQUIPMENT AND THE CARE ENVIRONMENT

- Routine cleaning and disinfection procedures are appropriate for SARS-CoV-2 in healthcare settings, including those patient-care areas in which aerosol-generating procedures are performed.
- 70% ethyl alcohol can be used to disinfect small areas between use, such as reusable dedicated equipment (for example, thermometers)
- The floor should be cleaned with 0.5% chlorine solution or 0.5% sodium hypochlorite solution (5000 parts per million, or 1-part household bleach with 5% sodium hypochlorite to 9 parts water)

or equivalent disinfectant at least every 6-8 hours in noncritical areas and every 3-4 hours in critical areas.

- All high touch surfaces (such as handles, light switches, bed and handrails, toilet bowl, tap knobs, etc.) in the patient's room should be cleaned at least every 3-4 hours with 0.5% chlorine solution or 0.5% sodium hypochlorite solution or equivalent disinfectant.
- Surface disinfection of tabletops, countertops and furniture surfaces with 0.5% chlorine solution or 0.5% sodium hypochlorite solution or equivalent disinfectant should be performed between patient consults in outpatient departments.
- Spillage of blood or body fluids should be managed by carefully covering the spill with disinfecting wipes with 0.5% chlorine solution or 1% sodium hypochlorite (10,000 parts per million) solution over it for at least 10 minutes, then removing the spillage carefully with the disinfecting wipes, followed by cleaning and disinfection with 0.5% chlorine solution or 0.5% sodium hypochlorite solution.
- Utility gloves or heavy duty, reusable plastic aprons used by the cleaning staff should be cleaned with soap and water and then decontaminated with 0.5% sodium hypochlorite solution after each use.

VIII. LAUNDRY

- All linen used in the care of suspected or confirmed COVID-19 patients should be managed as "infectious" linen and must be handled accordingly.
- Soiled laundry should be placed in clearly labeled, leak-proof bags or containers, after removing solid excrement if any.
- Linens can be machine washed with warm water at 60-90°C (140–194°F) with laundry detergent.
- If machine washing is not an option, laundry should be soaked in hot water and soap in a large drum using a stick to stir, while taking precautions to avoid splashing. Then the drum should be emptied and the laundry soaked in 0.05% chlorine for 30 minutes. The linens should finally be rinsed with clean water and fully dried in sunlight.

IX. WASTE MANAGEMENT

- The management of various types of waste produced during the care of suspected or confirmed COVID-19 should be done according to the Healthcare Waste Management Guidelines (2014) published by the Ministry of Health and Population Department of Health Services. In essence, all waste should be treated as potentially infectious waste. The management will be the same as for other patients with respiratory tract infections, with the staff members using adequate hand hygiene and personal protective equipment.
- The personnel handling health care waste should wear appropriate PPE (goggles or face shield, surgical mask, thick gloves, long-sleeved gown, thick gloves, water-resistant apron and boots).

X. HANDLING OF THE DEAD BODY

- There is an ongoing risk of transmission of infection via contact. A body bag should be used for transferring the body and those handling the body at this point should use personal protective equipment including gown, disposable gloves, surgical mask, goggles or face shield.
- The outer surface of the body bag should be decontaminated with 0.1% sodium hypochlorite (1000 parts per million) solution or equivalent disinfectant immediately before the body bag leaves the room. This may require at least two individuals wearing such protective clothing, in order to manage this process

- The trolley carrying the body must be disinfected prior to leaving the anteroom, including the wheels
- In the hospital mortuary, full personal protective equipment as above should be used if the body bag is opened.
- Any procedures that may result in aerosolization should be avoided. This includes autopsy unless required by the law.
- When the dead body is handed over to the patient's family, they should be educated about taking precautions to avoid spread of the virus. Activities such as kissing, hugging and bathing, etc need to be avoided.
- After use, empty body bags should be disposed of as hazardous waste.
- Please refer to the separate Covid-19 Ethical Guidelines from the Nepal Medical Council for details of handling of dead body.

Note: The NMC COVID-19 Treatment Guidance Committee is aware that the WHO recommends against disinfecting of the body before transfer to the mortuary area or using body bags routinely, given that SARS-CoV-2 virus is transmitted through droplets, fomites and close contact, not generally through airborne route. Since knowledge about the virus and the disease is still evolving, we are recommending the above until more evidence makes such caution unnecessary.

XI. OCCUPATIONAL HEALTH AND STAFF DEPLOYMENT

- Asymptomatic healthcare workers exposed to patients with proven or possible (not ruled out) COVID-19 should be asked to wear surgical mask at all times at work and temperature should be measured mandatorily every 6 hours during the shift. Appropriate hand hygiene should strictly be maintained.
- Significant exposure is defined as follows: a) being within 2 metres of a person with COVID-19 for a prolonged period of time (such as caring for or visiting the patient or sitting within 2 metres of the patient in a healthcare waiting area or room) without the use of surgical mask; or b) having unprotected direct contact with infectious secretions or excretions of the patient (e.g., being coughed on, touching soiled handkerchief with a bare hand) and not washing hands immediately afterwards.
- Where possible, healthcare facilities should arrange staffing in such manner that potentially exposed healthcare workers only take care of suspected or proven patients with COVID-19.
- Such healthcare worker immediately stop providing care for patients as soon as they develop fever or lower respiratory symptoms.
- They should be excluded from work until:
 - **Non-test-based Strategy (less preferable, used if/when molecular assay for COVID-19 not available):**
 - At least 3 days (72 hours) have passed since recovery defined as resolution of fever without use of fever-reducing medications AND improvement in respiratory symptoms (e.g. cough, shortness of breath); AND
 - At least 7 days have passed since symptoms first appeared
 - If healthcare worker has an alternative diagnosis explaining the fever or respiratory symptoms, the criteria for return to work should be based on that diagnosis.
 - **Test-based Strategy (preferable):**

- Resolution of fever without use of antipyretic medication AND resolution of respiratory symptoms
 - Negative results for COVID-19 from at least 2 nasopharyngeal swab specimens collected \geq 24 hours apart (total of 2 negative specimens)
- After returning to work, a healthcare worker should
 - Wear a facemask at all times in the hospital until all symptoms are completely resolved or until 14 days from onset of illness, whichever is longer.
 - Not be allowed to contact severely immunocompromised patients (e.g. transplant or oncology unit) until 14 days from onset of illness.
 - Self-monitor for symptom recurrence.

XII. REFERENCES

- WHO. Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected. Interim Guidance. 25 January 2020.
- CDC. Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings Accessed March 25, 2020
<https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>
- COVID-19: Guidance for infection prevention and control in healthcare settings. Version 1.0. Issued jointly by the Department of Health and Social Care, Public Health Wales, Public Health Agency Northern Ireland, Health Protection Scotland and Public Health England.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/874316/Infection_prevention_and_control_guidance_for_pandemic_coronavirus.pdf
- WHO. Rational use of personal protective equipment for coronavirus disease 2019 (COVID-19). Interim Guidance. 27 February 2020
- The National Institute for Occupational Safety and Health. Recommended Guidance for Extended Use and Limited Reuse of N95 Filtering Facepiece Respirators in Healthcare Settings.
<https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html>
- DC Health, Government of the District of Columbia. Coronavirus 2019 (COVID-19): Recommendations for Conserving the Supply of Personal Protective Equipment in DC. March 26, 2020.
- “John Hopkins Personal Preparedness Pack (JHM P3)” (Updated March 21, 2020)
- Lin T-H, Chen C-C, Huang S-H, Kuo C-W, Lai C-Y, Lin W-Y (2017) Filter quality of electret masks in filtering 14.6–594nm aerosol particles: Effects of five decontamination methods. PLoS ONE 12(10):e0186217. <https://doi.org/10.1371/journal.pone.0186217>
- CDC. Strategies for Optimizing the Supply of N95 Respirators: Crisis/Alternate Strategies. Accessed March 29, 2020. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/respirators-strategy/crisis-alternate-strategies.html>
- Aerosol and surface stability of HCoV-19 (SARS-CoV-2) compared to SARS-CoV-1. <https://www.medrxiv.org/content/10.1101/2020.03.09.20033217v1.full.pdf>
- The First Affiliated Hospital, Zhejiang University School of Medicine. Handbook of COVID-19 Prevention and Treatment. 2020.
- WHO. Water, sanitation, hygiene, and waste management for the COVID-19 virus (interim guidance) 19 March, 2020
- CDC. Return to Work Criteria for HCP with Confirmed or Suspected COVID-19. Accessed March 29, 2020. <https://www.cdc.gov/coronavirus/2019-ncov/healthcare-facilities/hcp-return-work.html>
- Government of Nepal Ministry of Health and Population. Health Care Waste Management Guideline. 2014.
- Nepal Medical Council COVID-19 Ethics Guidelines, 2076 Chaitra.
- WHO. Infection Prevention and Control for the safe management of a dead body in the context of COVID-19. March 24, 2020

XIII. **APPENDIX 1. “Dry nebulization” protocol metered-dose inhaler (MDI) with spacer/valved-holding chamber (VHC) (Adapted from the protocol of National University Hospital, Singapore)**

“Dry nebulization” protocol using metered-dose inhaler (MDI) with spacer/ valved-holding chamber (VHC)
<ul style="list-style-type: none"> • Jet nebulization is associated with aerosol generation and can facilitate the transmission of viruses e.g. SARS and possibly 2019-nCoV. • To reduce the risk of disease transmission, we recommend the use of “dry nebulization” in the treatment of acute airflow obstruction. • This is clinically equivalent to nebulization therapy in patients with moderate to severe airflow obstruction.
Instructions
<p>1. Selection of spacer or VHC Choose one with a mouthpiece or facemask depending on your patient’s ability to maintain effective seal (e.g. children, elderly with cognition, acute breathless patients) Prime the new spacer by firing ~ 10 puffs of Salbutamol to reduce the static build-up inside (check product information sheet).</p>
<p>2. Preparation Remove the cap of MDI Shake the inhaler 5-10 times Insert into back of spacer or VHC.</p>
<p>3. Ensure an effective seal Face mask: Place mask over the mouth and nose and ensure minimal gaps Mouthpiece: Put mouthpiece in mouth between teeth and close lips around it.</p>
<p>4. Slow breathing Instruct the patient to breathe in and out <u>slowly</u>. Tell patient to slow down breathing if the spacer/VHC whistles.</p>
<p>5. Administer 1 puff at a time (to reduce clumping of particles) Press the canister <u>once</u> at the beginning of a slow inhalation. Instruct patient to take in 5 slow breaths (“Breathe in and out slowly, 5 times”)</p>
<p>6. Breath-hold for 5 to 10 seconds (<i>optional</i>) Instruct patient to hold breath for 5 to 10 seconds, if he/ she is able to cooperate. This allows the medication time to deposit in the airways. Resume normal breathing</p>

7. Repeat steps 2-6 when more than 1 puff is prescribed.**Initial treatment:** repeat order every 10-20 min for 1st hour**Subsequent treatment:** Reduce frequency to every 4-8 hourly-prn
Reduce/ stop ipratropium after initial 24 hours***8. Escalate in event of poor response:**Severe features⁴

- Talks in words only, agitated
- Respiratory rate > 30/ min
- Pulse rate > 120/min
- SpO₂ < 90% (room air)

Life-threatening

- Drowsy, confused
- Silent chest on auscultation

Medication prescription for “dry nebulization”

Salbutamol (100mcg) 4 puffs

Ipratropium (20mcg)* 4 puff (if available, if not available then use salbutamol only)

Every 10-20 minute for 1st hour

Every 4-8 hours-prn, subsequently

**Ipratropium is administered in combination with short-acting beta-agonist (SABA), if there is poor response to initial SABA nebulization, during acute moderate to severe exacerbations. Though the 2007 NAEPP guidelines suggest that Ipratropium can be dosed up to maximum of 8 puffs every 20 minutes for the first 3 hours in an emergency setting. This is an off-label recommendation. Both GINA 2019 and SIGN 2019 do not explicitly state the recommended dose in an acute setting. As the recommended maximal total daily dose of Ipratropium is 204mcg, we recommend stopping/ reducing the dose after the initial 1-3 hours.*

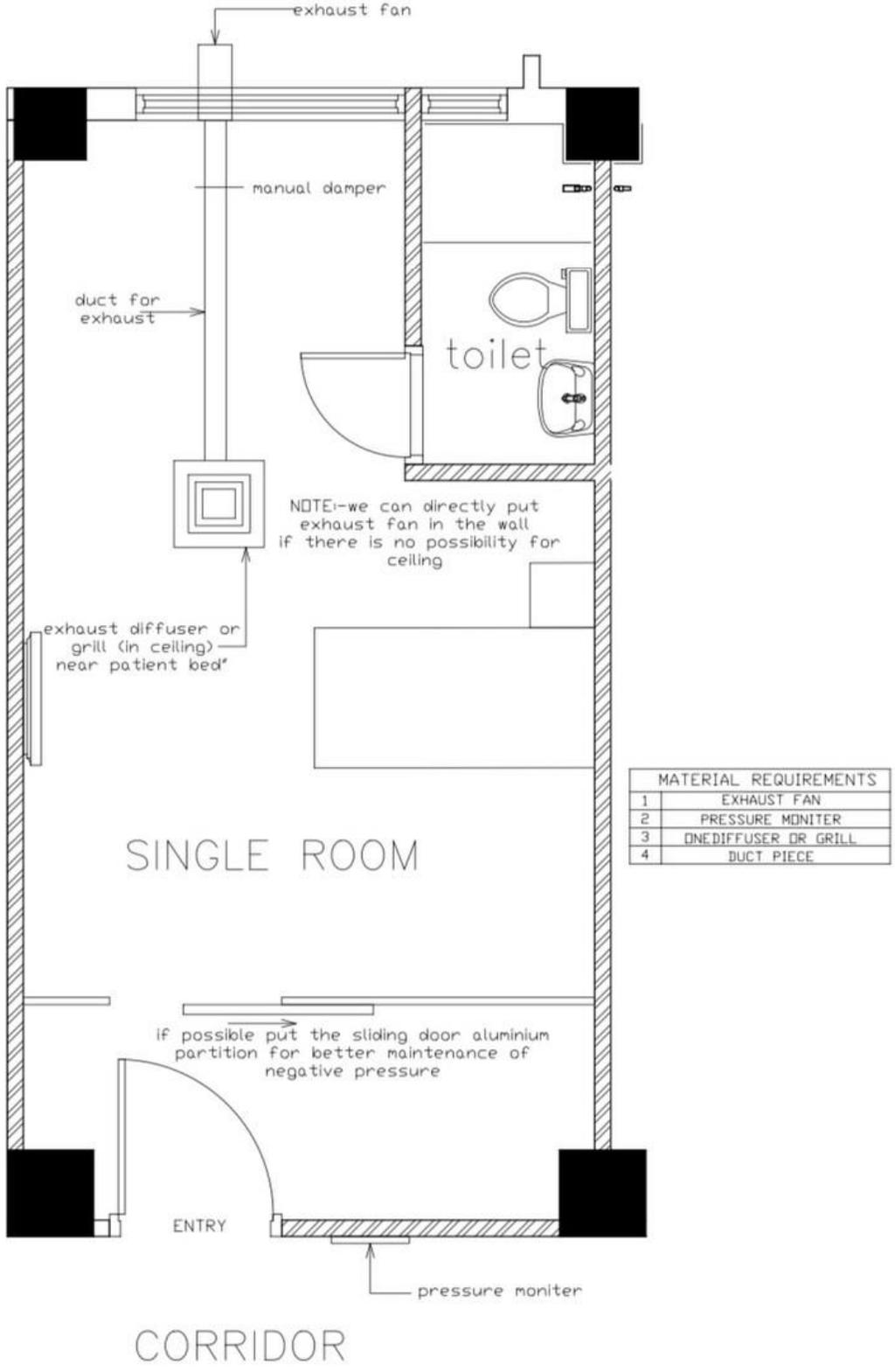
For patients with preexisting airway disease like asthma/COPD, regular long acting inhalers can be continued using MDI with spacer.

If patient is unable to use or has poor response to dry nebulization, switching to conventional nebulization may be needed. Airborne precaution must be applied and patient should preferably be in isolation room.

Use mesh nebulizer rather than jet nebulizer for mechanically ventilated patients where available.

Since disconnecting the ventilator circuit and nebulization generates aerosols, Healthcare workers must use airborne precaution and use appropriate PPE while caring for such patients with COVID19

XIV. Appendix 2: Possible modification of existing hospital room to build negative pressure chamber



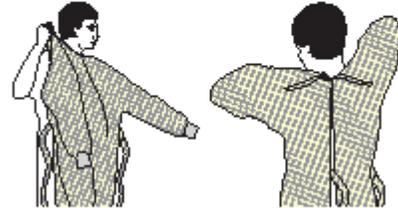
XV. **Appendix 3: Sequence for putting on and removing personal protective equipment**

SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

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

1. GOWN

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



2. MASK OR RESPIRATOR

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



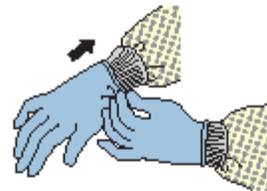
3. GOGGLES OR FACE SHIELD

- Place over face and eyes and adjust to fit



4. GLOVES

- Extend to cover wrist of isolation gown



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

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

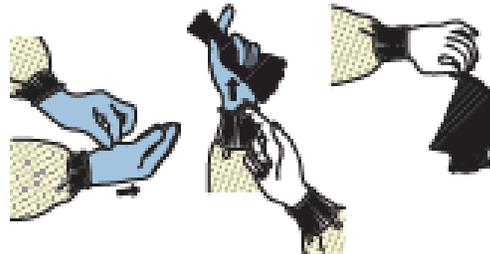


HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 1

There are a variety of ways to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Here is one example. Remove all PPE before exiting the patient room except a respirator, if worn. Remove the respirator after leaving the patient room and closing the door. Remove PPE in the following sequence:

1. GLOVES

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



2. GOGGLES OR FACE SHIELD

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



3. GOWN

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

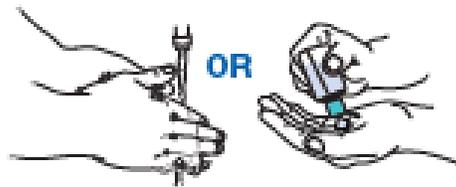


4. MASK OR RESPIRATOR

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



5. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE



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



Appendix 4: Guidelines for use of personal protective equipment (Developed by the Expert Team of NMC and Government of Nepal with reference from WHO, published on March 26, 2020)

- A. For Aerosol Generating procedures:** Dental procedures, bronchoscopy, Upper GI Endoscopy, ENT procedures, Nebulization, Intubation of a patient, CPR, Non-invasive ventilation, endotracheal suctioning, when obtaining nasopharyngeal or oropharyngeal swab, etc. **in Covid-19 suspected or confirmed cases health personnel need to use the following protective equipment: Category I PPE:**
- N-95 mask
 - Goggles or visor
 - Gloves (loose gloves acceptable)
 - Water resistant OR standard disposable gowns
 - Cap: Regular disposable
- B. For Non aerosol generating covid-19 suspected or confirmed patients: Health personnel need to use the following protective equipment: Category II PPE:**
- Surgical mask (seal the top edge with tape)
 - Goggles or visor
 - Gloves (loose gloves acceptable)
 - Water resistant or standard disposable gowns
 - Cap: Regular disposable
- C. For Physician/Staff running the fever/screening clinics the following PPE is recommended: Category II PPE**
- Surgical mask, (seal the top edge with a tape)
 - Goggles or visor
 - Water resistant or standard disposable gowns
 - Regular disposable Cap
 - Gloves (loose gloves acceptable)
- D. For escorts or drivers, the following PPE is recommended: Category III PPE:**
- Surgical masks
 - Gloves
 - If physical contact is expected, depending on circumstances, a gown PLUS goggles or face-shield are also recommended, otherwise need to maintain minimum 2 metres distance from the patient.
 - The patient should be given surgical mask and instructed to perform hand-hygiene.
- E. For Laboratory staff: category II or III PPE; depending upon the chance of splash:**
- surgical mask
 - Gown
 - Loose Gloves
 - Eye protection (if risk of splash)
- F. For all staff, including health care workers** involved in any activity that does not involve contact with COVID-19 patients and working in other areas of patient transit (e.g. wards, corridors). **No PPE required.**

For Everyone:

- *Maintain 3-6 feet distance while visiting patients, if no need to touch the patient.*
- *Mandatory hand-hygiene after each use of PPE and between patients.*

Mandatory surface cleaning of bed or furniture with 0.5% Chlorine disinfectant (Virex* or similar) between each patient in OPD or in an inpatient setting.

CONTRIBUTORS

This document was prepared by the Nepal Medical Council COVID-19 Treatment Guidance Committee.

- Dr Anup Subedee (Co-ordinator)
- Prof. Dr Subhash P Acharya (Member, and representative from Nepalese Society of Critical Care Medicine)
- Dr Prabhat Adhikari (Member)
- Dr Pravindra Adhikari (Member, and representative from Nepal Dental Association)
- Asst. Prof. Dr Badri Rijal (Member, and representative from Nepal Medical Association)
- Dr Sanjeet Krishna Shrestha (Member, and representative from Society of Internal Medicine of Nepal)
- Dr Sanjeeb Tiwari (Member, and representative from General Practitioners Association of Nepal)
- Prof. Dr Janak Koirala (Invited Expert)
- Dr Rakshya Pandey (Invited Expert)
- Dr Raju Pangen (Invited Expert)
- Prof. Dr Bhagawan Koirala (Chairman, Nepal Medical Council)