

**Introduction to COVID 19**

For Healthcare Providers

****

**Compiled and Edited by:**

**Dr. Abdul Rehman Pirzado**

# Contents

[Contents 2](#_Toc62118072)

[Handout 1 – Introduction 4](#_Toc62118073)

[Basic Epidemiological Definitions 4](#_Toc62118074)

[Disease Outbreak 4](#_Toc62118075)

[Case Definition 4](#_Toc62118076)

[Epidemic 4](#_Toc62118077)

[Endemic 4](#_Toc62118078)

[Pandemic 4](#_Toc62118079)

[Disaster 4](#_Toc62118080)

[Emergency 5](#_Toc62118081)

[Emergency Services 5](#_Toc62118082)

[Response 5](#_Toc62118083)

[Preparedness 5](#_Toc62118084)

[Coronavirus disease COVID-19 5](#_Toc62118085)

[Case Definitions 5](#_Toc62118086)

[Overview 5](#_Toc62118087)

[Coronavirus 6](#_Toc62118088)

[Human Coronavirus Types 6](#_Toc62118089)

[Modes of transmission 7](#_Toc62118090)

[Suspect COVID-19 Case 8](#_Toc62118091)

[Probable COVID-19 Case 8](#_Toc62118092)

[Confirmed COVID-19 Case 8](#_Toc62118093)

[Definition of Contact 8](#_Toc62118094)

[Symptoms 9](#_Toc62118095)

[Treatment 10](#_Toc62118096)

[Prevention 10](#_Toc62118097)

[Infection Prevention and Control (IPC) for COVID-19 11](#_Toc62118098)

[Screening and Triage 11](#_Toc62118099)

[Isolation or Designated Waiting Area 11](#_Toc62118100)

[Applying standard precautions for all patients 12](#_Toc62118101)

[Hand hygiene 12](#_Toc62118102)

[Respiratory hygiene 13](#_Toc62118103)

[Use of PPE 13](#_Toc62118104)

[Environmental cleaning 14](#_Toc62118105)

[Waste management 14](#_Toc62118106)

[Administrative measures related to health workers 14](#_Toc62118107)

[Administrative measures to manage visitors 14](#_Toc62118108)

[Spatial Separation and Physical Barriers 15](#_Toc62118109)

[Recommendation for Outpatient Care 15](#_Toc62118110)

[Dead Body Management 16](#_Toc62118111)

[Group Work -1 17](#_Toc62118112)

[Handout 2- 18](#_Toc62118113)

[Introduction 18](#_Toc62118114)

[Preventive measures for COVID-19 disease 18](#_Toc62118115)

[PPE Recommended According to the Setting, Personnel and Type of Activity 19](#_Toc62118116)

[Healthcare Facilities 19](#_Toc62118117)

[Sampling 24](#_Toc62118118)

[1. Donning and Doffing 25](#_Toc62118119)

[Donning 25](#_Toc62118120)

[Sequence of Donning 25](#_Toc62118121)

[Doffing 26](#_Toc62118122)

[Sequence of Doffing 26](#_Toc62118123)

[a. Gloves 26](#_Toc62118124)

[PPE – Specifications 26](#_Toc62118125)

[References 29](#_Toc62118126)

[Group Work 2 30](#_Toc62118127)

[Handout 3 - Guidelines for working of Outdoor Patient Departments/ 31](#_Toc62118128)

[Rationale 31](#_Toc62118129)

[Approach 31](#_Toc62118130)

[Outpatient department 32](#_Toc62118131)

[Patients Protection at OPD 34](#_Toc62118132)

[Telemedicine/Telehealth 35](#_Toc62118133)

[Group Work 3 36](#_Toc62118134)

[Handout - 4: Clinical Management Guidelines for COVID-19 Infections 37](#_Toc62118135)

[Testing Criteria 37](#_Toc62118136)

[Viral Lab testing for COVID 19 37](#_Toc62118137)

[Mild 38](#_Toc62118138)

[Moderate 38](#_Toc62118139)

[Severe 38](#_Toc62118140)

[Critical 38](#_Toc62118141)

[1. ARDS 38](#_Toc62118142)

[2. MULTIORGAN DYSFUNCTION 39](#_Toc62118143)

[3. SEPTIC SHOCK 39](#_Toc62118144)

[Criteria for admission of suspected or confirmed COVID-19 patients 39](#_Toc62118145)

[Asymptomatic and mild disease 39](#_Toc62118146)

[Moderate, severe and critical disease 39](#_Toc62118147)

[Management 40](#_Toc62118148)

[Prophylaxis 40](#_Toc62118149)

[Management of mild disease 40](#_Toc62118150)

[Management of moderate, severe, and critical disease 40](#_Toc62118151)

[Supportive care 41](#_Toc62118152)

[Steroids 41](#_Toc62118153)

[Anticoagulation 42](#_Toc62118154)

[If the patient was not on anticoagulation at the time of admission 42](#_Toc62118155)

[Dose 42](#_Toc62118156)

[Remdesivir 42](#_Toc62118157)

[Therapy in Cytokine Release Syndrome (CRS) 43](#_Toc62118158)

[Tocilizumab 43](#_Toc62118159)

[Antibiotics 43](#_Toc62118160)

[Investigational therapy 44](#_Toc62118161)

[Discontinuation of Isolation 44](#_Toc62118162)

[References 45](#_Toc62118163)

# **Handout 1 – Introduction**

# **Basic Epidemiological Definitions**

While learning about pandemic following definitions will help understand the frequently used epidemiological term

Disease Outbreak[[1]](#endnote-1) is the occurrence of cases of the disease above what would usually be expected in a defined community, geographical area, or season. Outbreaks are maintained by infectious agents that spread directly from person to person, from exposure to an animal reservoir or other environmental source, or via an insect or animal vector. Human behaviours nearly always contribute to such spread. Early detection and reporting of such events are crucial in minimizing their negative social and economic impact.

Case Definition[[2]](#endnote-2) is a set of diagnostic criteria that must be fulfilled to identify a case of a particular disease. Case definitions can be based on clinical, laboratory, epidemiological, or combined clinical and laboratory criteria. When a set of criteria is standardized for purposes of identifying a particular disease, then it is referred to as "standard case definition." A surveillance case definition is a standardized one and used to obtain an accurate detection of all cases of the targeted disease or condition in a given population while excluding the detection of other similar conditions.

Epidemic the occurrence in a community or region of cases of an illness, specific health-related behavior, or other health-related events clearly above average expectancy. The community or region and the period in which the cases occur are specified precisely. The number of cases indicating the presence of an epidemic varies according to the agent, size, and type of population exposed, previous experience or lack of exposure to the disease, and time and place of occurrence.

Endemic[[3]](#endnote-3) disease is defined as the constant presence of a disease or infectious agent within a given geographic area or population group; may also refer to the usual prevalence of a given disease within such an area or group.

Pandemic[[4]](#endnote-4) is defined as “an epidemic occurring worldwide, or over a extensive area, crossing international boundaries and usually affecting a large number of people.” The classical definition includes nothing about population immunity, virology, or disease severity. By this definition, pandemics can be said to occur annually in each of the temperate southern and northern hemispheres, given that seasonal epidemics cross international boundaries and affect a large number of people. However, seasonal epidemics are not considered pandemics.

Disaster is defined as “a serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability, and capacity, leading to one or more of the following: human, material, economic and environmental losses, and impacts.”[[5]](#endnote-5) Disasters can have causes that are biological (such as epidemics), hydro-meteorological (such as wildland fires, floods, landslides, avalanches, droughts, tsunamis, hurricanes, typhoons, cyclones, and tornadoes), geological (such as earthquakes, volcanic eruptions), and human (such as industrial accidents, conflicts, terrorist attacks).

Emergency is defined as “a sudden and usually unforeseen event that calls for immediate measures to minimize its adverse consequences.”[[6]](#endnote-6)

Emergency Services are defined as bodies that are available to handle major accidents and illnesses and their consequences, both on-site and off-site. Public emergency services include police, firefighting, emergency medical services, search, rescue and evacuation services, and other services regularly called upon to respond in emergencies, such as health and social services, armed forces, security and surveillance services, bomb disposal units, local governments, mortuary, and body-handling services, immediately necessary measures which are critical to allow rescue and stabilization, services responsible for the restoration of water and electricity supply, and related professions, such as social workers, according to need and national context.

Response is defined as “actions are taken directly before, during or immediately after a disaster to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.”[[7]](#endnote-7) This meaning extends to all types of emergencies covered in these guidelines.

Preparedness is the knowledge and capacities developed by governments, response and recovery organizations, communities, and individuals to effectively to anticipate to respond to, and recover from the impacts of likely, imminent or current disasters.”[[8]](#endnote-8)

# Coronavirus disease COVID-19

On 30 January 2020, the Director-General of WHO declared the coronavirus disease 2019 (COVID-19) outbreak a public health emergency of international concern (PHEIC) under the International Health Regulations (IHR 2005), following advice from the IHR Emergency Committee. On 4th February 2020, the Director-General of WHO briefed the Secretary-General of the United Nations and requested the activation of the United Nations crisis management policy to establish a Crisis Management Team (CMT) to coordinate the UN system-wide scale up to assist countries to prepare for and respond to COVID-19

## Case Definitions

WHO periodically updates the Global Surveillance for human infection with coronavirus disease (COVID-19) document which includes case definitions, [[9]](#endnote-9)

### Overview

Coronavirus disease (COVID-19)[[10]](#endnote-10) is an infectious disease caused by a newly discovered coronavirus.

Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment.  Older people and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop severe illness.

The best way to prevent and slow down transmission is to be well informed about the COVID-19 virus, the disease it causes, and how it spreads. Protect yourself and others from infection by frequently washing your hands with soap and water or using an alcohol-based rub and not touching your face, nose, and eyes.

The COVID-19 virus spreads primarily through droplets of saliva or respiratory secretions when an infected person coughs or sneezes, so it’s essential that you also practice respiratory etiquette (for example, by coughing into a flexed elbow).

At this time, there are number of vaccines available and in use and more than 200 candidate vaccines globally. The Pfizer-BioNTech vaccine has now been cleared for use across North America, Europe and the Middle East, and vaccination campaigns have begun in at least 51 countries. That shot and the vaccine from Moderna were both found to reduce coronavirus infections by 95% in trials of tens of thousands of volunteers. A vaccine by AstraZeneca Plc and University of Oxford got its first major authorization by the U.K., on Dec. 30, 2020. China and Russia authorized their own shots in July and August 2020, before they’d been fully tested. Since then, the countries have administered millions of doses, though they provide less frequent updates on their progress. More than 46.2 million doses have been administered in 51 countries. Two doses are needed for full protection with the vaccines currently in use. With the start of the global vaccination campaign, countries have experienced unequal access to vaccines and varying degrees of efficiency in getting shots into people’s arms.

Pakistan (DRAAP) has approved AstaZeneca/Oxford and Sinovac Biotech vaccines.

[Coronavirus [[11]](#endnote-11)](https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses)

Coronaviruses are a large family of enveloped viruses that may cause illness in animals or humans.  In humans, several coronaviruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The most recently discovered coronavirus causes coronavirus disease COVID-19

Human Coronavirus Types **[[12]](#endnote-12)**

Coronaviruses are named for the crown-like spikes on their surface. There are four main sub-groupings of coronaviruses, known as alpha, beta, gamma, and delta.

Human coronaviruses were first identified in the mid-1960s. The seven coronaviruses that can infect people are:

Common human coronaviruses

1. 229E (alpha coronavirus)
2. NL63 (alpha coronavirus)
3. OC43 (beta coronavirus)
4. HKU1 (beta coronavirus)

Other coronaviruses responsible of causing disease in human: These are basically animal types of coronaviruses causing diseases in human being.

1. MERS-CoV (the beta coronavirus that causes Middle East Respiratory Syndrome MERS)
2. SARS-CoV (the beta coronavirus that causes severe acute respiratory syndrome SARS)
3. [SARS-CoV-2 (the novel coronavirus that causes coronavirus disease 2019, or COVID-19](https://www.cdc.gov/coronavirus/2019-ncov/index.html))

People around the world commonly get infected with human coronaviruses 229E, NL63, OC43, and HKU1. Sometimes coronaviruses that infect animals can evolve and make people sick. Three recent examples of this are 2019-nCoV, SARS-CoV, and MERS-CoV.

Modes of transmission [[13]](#endnote-13)

Respiratory infections can be transmitted through droplets of different sizes: when the droplet particles are >5-10μm in diameter, they are referred to as respiratory droplets, and when then are <5μm in diameter, they are referred to as droplet nuclei.[[14]](#endnote-14) According to current evidence, the COVID-19 virus is primarily transmitted between people through respiratory droplets and contact routes. [[15]](#endnote-15) In an analysis of 75,465 COVID-19 cases in China, the airborne transmission was not reported.[[16]](#endnote-16)

Droplet transmission occurs when a person is in close contact (within 1 m) with someone who has respiratory symptoms (e.g., coughing or sneezing) and is therefore at risk of having his/her mucosae (mouth and nose) or conjunctiva (eyes) exposed to potentially infective respiratory droplets. Transmission may also occur through fomites in the immediate environment around the infected person. Therefore, the transmission of the COVID-19 virus can occur by direct contact with infected people and indirect contact with surfaces in the immediate environment or with objects used on the infected person (e.g., stethoscope or thermometer).

Airborne transmission is different from droplet transmission as it refers to the presence of microbes within droplet nuclei, which are generally considered to be particles <5μm in diameter, can remain in the air for long periods, and be transmitted to others over distances greater than 1 meter (3feet). In the context of COVID-19, the airborne transmission may be possible in specific circumstances and settings in which procedures or support treatments that generate aerosols are performed; i.e., endotracheal intubation, bronchoscopy, open suctioning, administration of nebulized treatment, manual ventilation before intubation, turning the patient to the prone position, disconnecting the patient from the ventilator, non-invasive positive-pressure ventilation, tracheostomy, and cardiopulmonary resuscitation.

### Suspect COVID-19 Case

A. A patient with acute respiratory illness (fever and at least one sign/symptom of respiratory disease, e.g., cough, shortness of breath), AND a history of travel to or residence in a location reporting community transmission of COVID-19 disease during the 14 days before symptom onset.

**OR**

B. A patient with an acute respiratory illness AND having been in contact with a confirmed or probable COVID-19 case (see definition of contact) in the last 14 days prior to symptom onset;

**OR**

C. A patient with severe acute respiratory illness (fever and at least one sign/symptom of respiratory disease, e.g., cough, shortness of breath, AND requiring hospitalization) AND in the absence of an alternative diagnosis that thoroughly explains the clinical presentation.

### Probable COVID-19 Case

A. A suspect case for whom testing for the COVID-19 virus is inconclusive. a. Inconclusive being the result of the test reported by the laboratory.

**OR**

B. A suspect case for whom testing could not be performed for any reason.

### Confirmed COVID-19 Case

A person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs, and symptoms.

### Definition of Contact

A contact is a person who experienced any one of the following exposures during the 2 days before and the 14 days after the onset of symptoms of a probable or confirmed case:

1. Face-to-face contact with a probable or confirmed case within 1 meter and for more than 15 minutes;

2. Direct physical contact with a probable or confirmed case;

3. Direct care for a patient with probable or confirmed COVID-19 disease without using proper personal protective equipment1; OR

4. Other situations, as indicated by local risk assessments.

Note: for confirmed asymptomatic cases, the period of contact is measured as the 2 days before through the 14 days *after the date on which the sample was taken* which led to confirmation

Symptoms [[17]](#endnote-17)

COVID-19 affects different people in different ways. Most infected people will develop mild to moderate illness and recover without hospitalization.

Most common symptoms:

* Fever.
* Dry cough.
* Tiredness.

Less common symptoms:

* Aches and pains.
* Sore throat.
* Diarrhea.
* Conjunctivitis.
* Headache.
* Loss of taste or smell.
* A rash on skin or discoloration of fingers or toes.

Serious symptoms:

* Difficulty in breathing or shortness of breath.
* Chest pain or pressure.
* Loss of speech or movement.

Seek immediate medical attention if you have severe symptoms.  Always call before visiting your doctor or health facility.

The most common symptoms[[18]](#endnote-18) of COVID-19 are fever, dry cough, and tiredness. Other symptoms that are less common and may affect some patients include aches and pains, nasal congestion, headache, conjunctivitis, sore throat, diarrhea, the new loss of taste or smell, or a rash on skin or discoloration of fingers or toes. These symptoms are usually mild and begin gradually. Some people become infected but only have very mild symptoms.

Most people (about 80%) recover from the disease without needing hospitalized treatment. Around one out of every 5 people who get COVID-19 becomes seriously ill and develops difficulty breathing. Older people, and those with underlying medical problems like high blood pressure, heart and lung problems, diabetes, or cancer, are at higher risk of developing a serious illness.  However, anyone can catch COVID-19 and become seriously ill.  People of all ages who experience fever and or cough associated with difficulty breathing/shortness of breath, chest pain/pressure, or loss of speech or movement should seek medical attention immediately. If possible, it is recommended to call the health care provider or facility first, so that patient can be directed to the right clinic

On average, it takes 5–6 days from when someone is infected with the virus for symptoms to show; however, it can take from 2 to 14 days.

### Treatment

There is no available treatment for COVID-19 disease.

Patients admitted to hospitals with different complications are managed accordingly based on the treatments available to reduce hospital admissions and relieve the symptoms of complications.

Prevention [[19]](#endnote-19)

There are vaccine available for the SARS 2 virus causing COVID-19 disease. Globally few are in practice. More than 200 candidate vaccines are under trials.

The Pfizer-BioNTech vaccine has now been cleared for use across North America, Europe and the Middle East, and vaccination campaigns have begun in at least 51 countries. That shot and the vaccine from Moderna were both found to reduce coronavirus infections by 95% in trials of tens of thousands of volunteers. A vaccine by AstraZeneca Plc and University of Oxford got its first major authorization by the U.K., on Dec. 30, 2020. China and Russia authorized their own shots in July and August 2020, before they’d been fully tested. Since then, the countries have administered millions of doses, though they provide less frequent updates on their progress. More than 46.2 million doses have been administered in 51 countries. Two doses are needed for full protection with the vaccines currently in use. With the start of the global vaccination campaign, countries have experienced unequal access to vaccines and varying degrees of efficiency in getting shots into people’s arms.

Pakistan (DRAAP) has approved AstaZeneca/Oxford and Sinovac Biotech vaccines.

To prevent infection and to slow transmission of COVID-19, do the following:

* Wash your hands regularly with soap and water, or clean them with alcohol-based hand rub using safe hand hygiene stepped techniques.
* Maintain at least a 1 -meter distance between you and people.
* Avoid touching your face, mouth, and eyes.
* Cover your mouth and nose when coughing or sneezing.
* Stay home if you feel unwell.
* Refrain from smoking and other activities that weaken the lungs.
* Practice physical distancing by avoiding unnecessary travel and staying away from large groups of people.

# Infection Prevention and Control (IPC) for COVID-19

It is critical to screen all persons at the first point of contact with the health-care facility as well as inpatients with suspected COVID-19 to allow for early recognition, followed by their immediate isolation/separation.

## Screening and Triage

To facilitate screening[[20]](#footnote-1) and triage[[21]](#footnote-2), health-care facilities should:

* Display information at the entrance of the facility directing patients with signs and symptoms of COVID-19 to report to the designated area for screening;
* Establish entrances for patients with signs and symptoms of COVID-19;
* Train staff on the signs and symptoms of COVID-19 and the most recent case definitions
* Encourage health workers to be alert to potential COVID-19 infection in all patients;
* Establish well-equipped screening and triage stations, where screening questionnaires are used according to the most recent WHO case definitions and where staff have access to adequate supplies of personal protective equipment (PPE), based on WHO’s rational use of PPE guidance;[[22]](#endnote-20)
* Ensure that screening personnel maintain a distance of at least 1 metre from patients, ideally with a separation created by a glass/plastic screen. If that is not possible, mask and eye protection should be worn;xxi
* Use a screening algorithm to promptly identify and direct patients with suspected COVID-19 to an isolation room or dedicated COVID-19 waiting area; all suspected COVID-19 patients should wear masks for source control purposes and be positioned at least 1 metre (3 feet) apart from each other in a designated, well-ventilated, waiting area;
* Ensure that a process is in place to reduce the amount of time suspected COVID-19 patients wait to be screened
* After screening and isolation, triage patients using standardized and validated triage tools (e.g. WHO/ICRC/MSF/IFRC Integrated Interagency Triage Tool) to identify those in need of immediate care and those that can safely wait. Refer to WHO’s clinical management of COVID-19 interim guidance.[[23]](#endnote-21)
* Suspected COVID-19 patients with symptoms of respiratory distress and severe underlying conditions should be prioritized for medical evaluation.

## Isolation or Designated Waiting Area

* Health-care facilities without enough single isolation rooms in emergency departments should designate a separate, well-ventilated area where patients with suspected COVID-19 can wait. This area should have benches, stalls or chairs placed at least 1 metre apart;
* The isolation or designated area should have dedicated toilets, hand hygiene stations, and trash bins with lid for disposal of paper tissues used for respiratory hygiene or after hand washing;
* Display graphic information for patients to show them how to perform hand and respiratory hygiene.

To prevent transmission of COVID-19 in health-care facilities it is necessary to promptly detect inpatients with suspected COVID-19, who were missed by screening and triage efforts or became infected within the facility. This can be quite challenging given the high numbers of acute respiratory infections and the atypical clinical presentations of COVID-19.

Health-care facilities should:

* Encourage health workers to look out for potential COVID-19 cases, especially when inpatients show signs and symptoms of COVID-19 and there is no other clear explanation for these symptoms;
* Encourage rapid testing and reporting of patients with suspected COVID-19 who have been identified after hospitalization;
* Establish reminder systems to clinicians to consider COVID-19, based on signs and symptoms especially in areas with community transmission.

## Applying standard precautions for all patients

Standard precautions aim to reduce the risk of transmission of blood borne and other pathogens from both recognized and unrecognized sources. They represent the basic level of infection control precautions that should be used at all times in the care of all patients. Standard precautions include, but are not limited to, hand and respiratory hygiene, the use of appropriate PPE according to risk assessment xxi environmental cleaning, and safe waste management.

## Hand hygiene

Hand hygiene is one the most effective measures to prevent the spread of COVID-19 and other pathogens. For optimal hand hygiene performance, health workers should apply the following principles: [[24]](#endnote-22),[[25]](#endnote-23)

* Perform hand hygiene according to the WHO’s [My 5 Moments for Hand Hygiene](https://www.who.int/infection-prevention/campaigns/clean-hands/5moments/en/) approach in the following five situations: before touching a patient, before any clean or aseptic procedure is performed, after exposure to body fluid, after touching a patient, and after touching a patient’s surroundings;
* Hand hygiene includes either cleansing hands with an alcohol-based hand rub (ABHR) containing at least 70% alcohol, or with soap, water and disposable towels;
* Alcohol-based hand rub products are preferred if hands are not visibly soiled;
* Wash hands with soap and water when they are visibly soiled;
* Use the appropriate technique and duration for performing hand washing or hand rubbing.

## Respiratory hygiene

Ensure that the following respiratory hygiene measures are used:

* Display graphic information on the need to cover nose and mouth with a tissue or bent elbow when coughing or sneezing;
* Perform hand hygiene after contact with respiratory secretions or objects that may be potentially contaminated with respiratory secretions;
* Give patients with suspected COVID-19 a medical mask to wear.

## Use of PPE

The rational and correct use of PPE reduces exposure to pathogens. The effectiveness of PPE strongly depends on:

* Staff training on putting on and removing PPE;[[26]](#endnote-24)
* Prompt access to sufficient supplies; xxi
* Appropriate hand hygiene;
* Health worker compliance;

## Environmental cleaning

It is important to ensure that cleaning and disinfection procedures are followed consistently and correctly. All surfaces in health-care facilities should be routinely cleaned and disinfected, especially high-touch surfaces, and whenever visibly soiled or if contaminated by body fluids

## Waste management

Health-care waste produced during the care of patients with suspected or confirmed COVID-19 is considered to be infectious and should be collected safely in clearly marked lined containers and sharp safe boxes.[[27]](#endnote-25)

## Administrative measures related to health workers

These measures include**:**

* Provision of adequate training for health workers;
* Ensuring an adequate patient-to-staff ratio;
* Establishing an active syndromic surveillance of health workers at the facility entrance when they arrive at work;
* Ensuring that health workers and the public understand the importance of seeking medical care promptly;
* Monitoring health workers’ compliance with standard precautions and providing mechanisms for improvement as needed.

## Administrative measures to manage visitors

Ideally all health-care facilities in areas with COVID-19 community transmission should implement policies to restrict visitor access. This measure aims not only to protect visitors from getting infected, but also to reduce visitors' potential to introduce the COVID-19 virus into the health-care facilities. Health-care facilities should:

* Identify alternatives for direct interaction between patients, family members, other visitors and clinical staff, including making remote communications available (e.g. telephone, internet connection);
* Restrict entry to visitors who are essential such as the parents of pediatric patients and caregivers;
* Encourage family members to assign a single caregiver to the patient. These caregivers should not be people who are at high risk for severe COVID-19, such as older people or people with underlying medical conditions;
* Designate an entrance that visitors who are caregivers can use to access the health-care facility;
* Maintain a record of all visitors allowed in the facility;
* Educate caregiver visitors on hand hygiene, respiratory etiquette, physical distancing and other standard precautions, and how to recognize the signs and symptoms of COVID-19;
* Train and supervise caregiver visitors of patients with suspected or confirmed COVID-19 patients on the use of required PPE (i.e. droplet and contact precaution);
* Caregiver visitors in areas with community transmission, including those caring for patients without suspected or confirmed COVID-19, should wear a medical mask in clinical areas to prevent transmission; [[28]](#endnote-26)
* Restrict movement of the visitor within the healthcare facility;
* Conduct active screening of all caregiver visitors before entering the facility in areas with widespread community transmission;
* Reduce traffic to the health-care facility: consider relocating outpatient pharmacy or other services to a location outside of the main health-care facility.

## Spatial Separation and Physical Barriers

Spatial separation of at least 1 metre (3 feet) should be maintained between patients at all times. Both spatial separation and adequate ventilation can help to reduce the spread of many pathogens in the health-care facility.Use of physical barriers such as glass or plastic windows can also reduce health workers’ exposure to the COVID-19 virus. This approach can be implemented in the areas of health-care facilities where patients first present, such as screening and triage areas, registration desk at the emergency department, or at the pharmacy window where medication is collected.

## Recommendation for Outpatient Care

The basic principles of IPC and standard precautions should be applied in all health-care facilities, including outpatient settings and primary care.57 For COVID-19, the following measures should be adopted:

* Consider alternatives to face-to-face outpatient visits using telemedicine (e.g. telephone consultations or cell phone videoconference) to provide clinical support without direct contact with the patient; [[29]](#endnote-27)
* Screening, early recognition and isolation of patients with suspected COVID-19;
* emphasis on hand hygiene, respiratory hygiene and medical masks to be used by patients with respiratory symptoms;
* Appropriate use of contact and droplet precautions when performing clinical exam on patients with suspected COVID-19;
* Prioritization of care of symptomatic patients;
* When symptomatic patients are required to wait, ensure they have a separate waiting area where patients can sit at least 1-meter apart and provide them with masks;
* Educate patients and families about the early recognition of symptoms, basic precautions to be used and which health-care facility they should refer to if any family member shows signs of COVID-19.

## Dead Body Management

Health workers should do a preliminary evaluation and risk assessment before undertaking any activity related to the management of suspected or confirmed COVID-19 fatality and follow WHO’s IPC guidance for safe management of dead bodies in the context of COVID-19.59 Health workers should:

* Perform hand hygiene before and after handling the body;
* use Appropriate PPE based on the level of interaction with the body and risk assessment (e.g. use of eye protection and medical masks in addition to gloves and fluid-resistant gown or apron, if there is a risk of body fluids splashes while handling the body);
* Ensure that any body fluids leaking from orifices are contained and cover body in cloth to transfer to mortuary area;
* Do not engage in any other activity during body handling or preparation;
* Disinfect any non-disposable equipment used during handling of the body as per WHO guidance on cleaning and disinfection in the context of COVID-19;
* Correctly remove and dispose of PPE when finished.[[30]](#endnote-28)
* Body bags are not necessary for COVID-19, although they may be used for other reasons such as excessive body fluid leakage or absence of refrigerated morgue, especially in countries with a warm climate. If more than 24 hours has passed since the person died, or if burial/cremation is not foreseen within the next 24–48 hours, a second body bag may be used.

**Report you facilitator when you complete reading**

Group Work -1: Infection Prevention and Control (IPC) protocols and activities to minimize risk of COVID-19

Date: Venue: Group:

|  |  |
| --- | --- |
| PROTOCOL | ACTIVITY |
| HAND HYGIENE |  |
|  |
|  |
|  |
| RESPIRATOTY HYGIENE |  |
|  |
|  |
|  |
| ENVIRONMENTAL HYGIENE |  |
|  |
|  |
|  |

Handout 2- **Guidance on Rational Selection & Use of Personal Protective Equipment (PPE)**

# Introduction

Coronavirus Disease 2019 (COVID-19) is a respiratory disease caused by the SARS-CoV-2 virus. It has risen to the level of a pandemic and is affecting all aspects of daily life, including travel, trade, tourism, food supplies, and financial markets. To reduce the impact of COVID-19 outbreak conditions on businesses, workers, customers, and the public, it is important to plan according to the specific exposure risks and sources, routes of transmission, and other unique characteristics of SARS-CoV-2.

# Preventive measures for COVID-19 disease

Based on the available evidence, the COVID-19 virus is transmitted between people through close contact and droplet transmission. The people most at risk of infection are those who are in close contact with a COVID-19 patient or asymptomatic carrier. Preventive and mitigation measures are key.

The most effective preventive measures in the community include:

* performing hand hygiene frequently with an alcohol-based hand rub if your hands are not visibly dirty or with soap and water if hands are dirty;
* avoiding touching your eyes, nose, and mouth;
* practicing respiratory hygiene by coughing or sneezing into a bent elbow or tissue and then immediately disposing of the tissue;
* wearing a surgical/medical mask if you have respiratory symptoms and performing hand hygiene after disposing of the mask;
* maintaining social distance (a minimum of 3 feet) from persons with respiratory symptoms.

Additional precautions are required by healthcare workers (HCWs) to protect themselves and prevent transmission in the healthcare settings. Precautions to be implemented by HCWs caring for patients with COVID-19 include using PPE appropriately; this involves selecting proper PPE and being trained in how to put on, remove, and dispose of it.

PPE is only one effective measure within a package of administrative and environmental and engineering controls, as described in WHO’s Infection prevention and control of epidemic- and pandemic-prone acute respiratory infections in healthcare.

This document has been prepared with the WHO Interim Guidance dated 19 March 2020 as the base for rational utilization of PPE. It is highlighted that each institute can have this as minimal standard but needs to **exercise the bio-risk assessment for using appropriate PPEs**. The institutional IPC Committee or the head of institution where no such committee exists, can play a key role for carrying out the bio risk assessment on the basis of local situation/evidence. The document is live/interim and will keep getting modified in the light of evolving situation.

Bio-risk Assessment for Rational use of PPE:

* use of appropriate disinfectants
* handling of PPEs (When to use PPE, What PPE items to use, The limitations of their PPE, How to put on and remove PPE, How to dispose of PPE correctly, How to clean, disinfect and maintain PPE,
* Considerations as to which PPE items can be used for a whole session of work rather than for a single patient or resident contact

# PPE Recommended According to the Setting, Personnel and Type of Activity

# Healthcare Facilities

|  |  |  |  |
| --- | --- | --- | --- |
| Setting | Target personnel or patients | Activity | Type of PPE or procedure |
|  Inpatient facilities  |
| Patient room  | HCWs  | Providing direct care to COVID-19 patients  | Surgical/Medical mask/N-95\* Gown Gloves Eye protection (goggles or face shield)  |
|  |  | Aerosol-generating procedures performed on COVID-19 patients  | Respirator N95 or FFP2 standard, or equivalent. Gown/Tyvek\* Gloves Eye protection Apron  |
| Cleaners  | Entering the room of COVID-19 patients  | Surgical/Medical mask Gown Heavy duty gloves Eye protection (if risk of splash from organic material or chemicals) Boots or closed work shoes  |
| Visitors\*\* Preferably no visitors  | Entering the room of COVID-19 patients  | Surgical/Medical mask Gown Gloves  |
| Other areas of patient transit (e.g. wards, corridors).  | All staff, including HCWs.  | Any activity that does not involve contact with COVID-19 patients  | Surgical/Medical mask  |
| Triage  | HCWs  | Preliminary screening not involving direct contact  | Maintain spatial distance of at least 3 feet.  Surgical/Medical mask  |
| Patients with respiratory symptoms  | Any  | Maintain spatial distance of at least 3 feet. Provide Surgical/medical mask if tolerated by patient.  |
| Patients without respiratory symptoms  | Any  |  Surgical/Medical mask  |
| Administrative areas  | All staff, including HCWs.  | Administrative tasks that do not involve contact with COVID19 patients.  | Surgical/Medical mask Spatial distance of at least 3 feet.  |

\* Based upon local risk assessment by IPC Committee

\*\*Preferably no visitors allowed. However, where there is shortage of HCWs and there is requirement to assist the HCWs a single attendant may be allowed.

|  |  |  |  |
| --- | --- | --- | --- |
|  Setting | Target personnel or patients | Activity | Type of PPE or procedure |
|  Outpatient facilities  |  |  |
| Consultation room  | HCWs   | Physical Examination of patient with respiratory symptoms  | Surgical/Medical mask/N95\* Gown Gloves Eye protection  |
| Physical Examination of patients without respiratory symptoms  | PPE according to standard precautions and risk assessment. Surgical/Medical mask Gown Gloves  |
| Patient with respiratory symptoms  | Any   | Provide Surgical/medical mask  |
| Patient without respiratory symptoms  | Any   |  Surgical/Medical mask  |
| Cleaners  | After and between consultations with patients with respiratory symptoms.  | Surgical/Medical mask Gown Heavy duty gloves Eye protection (if risk of splash from organic material of chemicals). Boots or closed work shoes.  |
| Waiting room  | Patient with respiratory symptoms  | Any  | Provide Surgical/Medical mask Immediately move the patient to an isolation room or separate area away from others; if this is not feasible, ensure spatial distance of at least 3 feet from other patients.  |
| Patient without respiratory symptoms  | Any  | Surgical/Medical mask Spatial distance of at least 3 feet  |
| Administrative Areas  | All staff, including HCWs  | Administrative tasks  |  Surgical/Medical mask  |
| Triage  | HCWs  | Preliminary screening not involving direct contact.  | Maintain spatial distance of at least 3 feet. Surgical/Medical mask  |
| Patients with respiratory symptoms  | Any  | Maintain spatial distance of at least 3 feet. Provide Surgical/medical mask if tolerated.  |
| Patients without respiratory symptoms  | Any  |  Surgical/Medical mask  |

 \* Based upon local risk assessment by IPC Committee

|  |  |  |  |
| --- | --- | --- | --- |
|  Setting  | Target personnel or patients  | Activity  | Type of PPE or procedure  |
|  Community  |
| Home  | Patient with respiratory symptoms  | Any   | Maintain spatial distance of at least 3 feet. Provide Surgical/medical mask if tolerated, except when sleeping.  |
| Caregiver  | Entering the patient’s room, but not providing direct care or assistance  | Surgical/Medical Mask  |
| Providing direct care or when handling stool, urine or waste from COVID-19 patient being cared for at home  | Gloves Surgical/Medical Mask Apron (if risk of splash)  |
| HCWs  | Providing direct care or assistance to a COVID-19 patient at home  | Surgical/Medical Mask/N95\* Gown Gloves Eye protection  |
| Public areas  | All individuals  | (e.g. schools, shopping malls, train stations)  | Surgical/medical mask spatial distance of at least 3 feet  |
| Special considerations for rapid-response teams assisting with public health investigations  |
| Community  |
| Anywhere  | Rapid-response team (RRT) investigators  | Remote Interview suspected or confirmed COVID- | No PPE if done remotely (e.g. by telephone or video conference).  |
|  |  | 19 patients or their contacts  | Remote interview is the preferred method.  |
| In-person interview of suspected or confirmed COVID-19 patients and their contacts  | Maintain spatial distance of at least 3 feet N95 Gown Gloves Eye protection Confirmed or suspected COVID-19 patients should wear a Surgical/medical mask if tolerated.  |

\* Based upon local risk assessment by IPC Committee

|  |  |  |  |
| --- | --- | --- | --- |
| Setting  | Target personnel or patients  | Activity  | Type of PPE or procedure  |
|  Points of Entry   |  |  |  |
| Administrative Areas  | All staff  | Any  |  Surgical/Medical mask  |
| Screening area  | Staff   | Screening (e.g. interviewing passengers with fever for clinical symptoms suggestive of COVID19 disease and travel history).  | Maintain spatial distance of at least 3 feet Surgical/Medical Mask Gown Gloves  |
| Cleaners  | Cleaning the area where passengers with fever are being screened  | Surgical/Medical mask Gown Heavy duty gloves Eye protection (if risk of splash from organic material of chemicals). Boots or closed work shoes  |
| Temporary isolation area  | Staff  | Entering the isolation area, but not providing direct assistance  | Maintain spatial distance of at least 3 feet. Surgical/Medical mask Gloves  |
|  | Staff, HCWs  | Assisting passenger being transported to a healthcare facility  | Surgical/Medical mask/N95\* Gown Gloves Eye protection  |
| Cleaners  | Cleaning isolation area  | Surgical/Medical mask Gown Heavy duty gloves Eye protection (if risk of splash from organic material of chemicals). Boots or closed work shoes  |

|  |  |  |  |
| --- | --- | --- | --- |
| Setting  | Target personnel or patients  | Activity  | Type of PPE or procedure  |
|  Points of Entry (c0nt..) |  |  |
| Ambulance or transfer vehicle  | HCWs  | Transporting suspected COVID-19 patients to the referral healthcare facility  | Surgical/Medical mask Gown Gloves Eye protection  |
| Driver  | Involved only in driving the patient with suspected COVID-19 disease and the driver’s compartment is separated from the COVID-19 patient  | Maintain spatial distance of at least 3 feet. Surgical/Medical mask   |
| Assisting with loading or unloading patient with suspected COVID-19  | Surgical/Medical mask/N95 Gown Gloves Eye protection  |
| No direct contact with patient with suspected COVID-19, but no separation between driver’s and patient’s compartments  | Surgical/Medical mask   |
| Patients with suspected COVID-19  | Transport to the referral healthcare facility.  | Surgical/Medical mask if tolerated   |
| Cleaners  | Cleaning after and between transport of patients with suspected COVID-19 to the referral healthcare facility  | Surgical/Medical mask Gown Heavy duty gloves Eye protection (if risk of splash from organic material of chemicals). Boots or closed work shoes  |

\* Based upon local risk assessment by IPC Committee

## Sampling

|  |  |  |  |
| --- | --- | --- | --- |
|  Setting  | Target personnel or patients  | Activity  | Type of PPE or procedure  |
| Laboratory or dedicated sampling area  | HCWs  | Taking Nasopharngeal Oropharangeal Swab of COVID suspects  | N95 Gown Gloves Eye protection  |

 Laboratory

|  |  |  |  |
| --- | --- | --- | --- |
| Setting  | Target personnel or patients  | Activity  | Type of PPE or procedure  |
| Laboratory  | Laboratory workers dealing samples  | Laboratory Testing  | N95 Gloves Tyvek suits Eye protection (PAPR in case biosafety cabinets are not available)  |

1. In addition to using the appropriate PPE, frequent hand hygiene and respiratory hygiene should always be performed. PPE should be discarded in an appropriate waste container after use, and hand hygiene should be performed before putting on and after taking off PPE.
2. The number of visitors should be restricted. If visitors must enter a COVID-19 patient’s room, they should be provided with clear instructions about how to put on and remove PPE and about performing hand hygiene before putting on and after removing PPE; this should be supervised by a HCW.
3. This category includes the use of no-touch thermometers, thermal imaging cameras, and limited observation and questioning, all while maintaining a spatial distance of at least 3 feet.
4. All rapid-response team members must be trained in performing hand hygiene and how to put on and remove PPE to avoid self-contamination.

 NOTE: All the disposable PPEs must be treated and disposed of as infectious waste.

# Donning and Doffing

Effective use of PPE includes properly wearing, removing and disposing of contaminated PPE to prevent exposing both the wearer and others to infection.

## Donning

### Sequence of Donning

1. Hand hygiene/ Hand wash
2. Gown / Apron / Tyvek Suit
3. Surgical/mask
4. Eye Protection (Googles/Face Shield)
5. Gloves



##

##  Doffing

### Sequence of Doffing

### Gloves

1. Hand Hygiene
2. Eye protection
3. Gown
4. Hand Hygiene
5. Mask
6. Hand Hygiene



Source: Reproduced from CDC Document

## PPE – Specifications

 **N95 Mask:** 3M Preferably 1860, if not available then 8210 Plus, last preference to 8210, Particulate Respirator, collapse resistant cup shape design with adjustable nose clips, soft nose foam, patented filter media, 3M Company. These N95 respirators, Class I or II devices regulated by the FDA, BFE (Bacterial Filtration Efficiency) according to ASTM F2101, NIOSH certified. SIZE: (70% medium and 30 % large) AND/OR N95.

* + - Tested for mean particle size of 0.6 Microns.
		- Filtering efficiency: More than 95%.
		- Aluminum Nose clip for better fit.
		- Silicon and latex free.
		- Polyester inner and outer shells.
		- Head straps are ultrasonically bonded to the mask, no staples are used
		- N95 mask Weight below 12 grams.
		- N95 mask is NIOSH certified product (N95 without filters are required).

Different countries have different standards; need to be procure from validated sources.

1. **Tyvek Suits:** Classic expert, Cat III, superior type 5/6 protection. SIZE: (70% medium and 30 % large)
2. **Surgical Gowns:** Disposable Isolation Gowns - latex free Knit Cuffs
	* Made of non-woven polypropylene material coated with a water repellent agent for added protection.
	* Material is breathable which prevents irritating hot temperature build-up.
	* Waist ties are designed to tie in back for ease of use.
	* Single-use, length mid-calf
	* FDA Class I or II medical device, or equivalent
	* EN 13795 any performance level, or
	* AAMI PB70 all levels acceptable, or equivalent
3. **Nitrile Gloves (Without Powder):** Nitrile Material, latex free, disposable, CE, EN388/ EN 455/EN 374 FDA, any color. Sizes (20 % Small, 50 % Medium, 30 % large)
4. **Latex Gloves:** Disposable Latex Gloves
* Material: Natural rubber latex
* Flexibility and strength
* Wet and dry grip
* Prevents permeation by chemicals and micro-organisms
* Puncture, tear-resistant, and abrasion-resistant
* Standards: ASTM 6319, EN420, and EN455
* Packing: 100/Box (20 % Small, 50 % Medium, 30 % large)
1. **Surgical Gloves:** Gloves, examination or surgical, nitrile, powder-free, sterile, single-use Gloves should have long cuffs, reaching well above the wrist, ideally to mid-forearm Sizes: small, medium, large
2. **Goggles:** The American National Standards Institute & International Safety Equipment Association
	* (ANSI/ISEA Z87.1-2015) Standard eye protection to prevent or minimize injuries from eye hazards or equivalent standards.
3. **Face Shields:** Anti-fog, with thick sponge, Hypoallergenic foam band can absorb sweat and provide enough room for eyeglasses or safety goggles. • Vented foam design for increased air flow and comfort.
	* Sonically welded band gives the face shield added strength and reliability, in elastic band or adjustable Velcro band.
	* Lightweight and comfortable to wear, quick and easy to don.
	* Should offer protection against potential contamination from pathogens, body fluids, or harmful chemical splash.
	* All straps can be sonically welded or secured to the shield with an eyelet for safety.
	* Visor and headgear meet CE EN1731, EN166 and ANSI standard.
4. **Hand Sanitizers (1 Liter):** Alcohol based hand sanitizer. Needs to have a strength of at least 60 percent isopropyl alcohol or 70% ethanol
	* Advanced gel or solution-based hand sanitizer formulation designed for healthcare environments.
	* Kills more than 99.99% of most common germs that may cause illness in a healthcare setting.
5. **Disposable Head Covers:** Disposable surgical non-woven cap, for medical care, Hospital use having clip hair net cover.
6. **Shoe Cover:** Disposable Shoe & Boot Covers
	* Waterproof Slip Resistant.
	* Covers contain an elastic band for flexibility
	* Fits all shoes/boots up to size 12.
7. **Gum Boots:** Very light and comfortable
	* Anti-slip with optimal foot support
	* Chemical protection, waterproof, impact-resistant, anti-static.
	* Size 8 & 9 (40 % each), size 10 (10%) and size 11 (10%)
8. **Waste Bins (10 Liters):** Waste disposal bins with covers.
	* Specs: ISO9001:2008. Plastic product, Waterproof
	* Capacity: 10 L bin with pedal.
	* If not available, then any PVC Plastic foot pedaled for healthcare facility use
9. **Biohazard Bags (18 Liters):** Biohazard disposal bag, bright red, features one long flap for easy opening.
	* Printed with biohazard symbol and sterilization indicator patch.
	* Made from high molecular weight high-density polyethylene.
	* Pass ASTM 1922 Tear Resistance or equivalent standards.
	* Size allows bag to be inverted over hand to safely pick up waste.
	* Steam autoclavable at 121°C (250°F).
10. **Mackintosh bed sheets:** Mackintosh rubber sheet
	* Waterproof
	* Thickness minimum 0.35 mm
	* Color Brown/red
	* Size 7x5 feet
11. **Disposable bed sheets:** Disposable Bed Sheets to protect and guard against incontinence and spills.
* Made from durable tissue and polyethylene film, or non-woven fabric and PE film.
* It should be a non-woven material that is designed for single use.
* Disposable medical linens, sterilization, dust and other effects, lightweight, comfortable, odorless, fiberglass free, non-irritating to the skin, and waterproof. Any colour size 9x7 feet.
1. **Surgical/Medical Masks:** 3-Ply pleated design with Breath Cool filter offers micro filtration without moisture build-up.
	* Slim aluminum and PVC wire preferably.
	* Fits comfortably over the nose to maintain maximum filtration.
	* Dye-free, chemical-free, fiberglass-free, with latex-free elastic ear loops. middle layer of melt blown non-woven polypropylene or equivalent filtration media.
	* Bacteria Filtration Efficiency (BFE) 80.
	* Size: 7″ x 3.5″
	* ASTM F2100 minimum Level 1 or equivalent.
2. **Absolute Ethanol:** Ethyl alcohol, 99.8+%, CH3CH2OH, molecular weight: 46.07 g/mol, Certified AR meets analytical specification of Ph.Eur., BP, Fisher Chemical.
3. **VTM (Viral Transport Medium):** For collection and transport of samples for Nucleic acid amplification test.
	* Sterile dacron swab in plastic package.
	* Nucleic acid transport medium (20mM Tris (pH 8.0,) 2mM EDTA) 3ml in plastic tube.
	* Comply with the CLSI standard M40-A (for the Quality Control of Microbiology Specimen Transport Devices).
	* Compatible with molecular and cell culture techniques.
4. **PAP Respirators:** The system should contain four primary components, a helmet with power cord, battery, belt and charger.
	* + Various components, fan, filter, airflow system and motor, should also be integrated.
		+ The filter cartridge should be housed in the helmet, with the filter cover cap (FCC) securely placed over it.
		+ Headband adjustments should be positioned for secured wearing.
5. **Sharps Container Boxes:** Puncture-resistant container for collection and disposal of used, disposable and auto-disable syringes and needles.
	* + - 5 L capacity accommodating approximately 100 syringes.
			- Boxes to be prominently marked.
			- WHO performance specification E10/IC.1.
			- WHO/UNICEF standard E10/IC.2 or equivalent.

## References [[31]](#endnote-29)

**Report you facilitator when you complete reading**

Group Work 2: Priority Setting of Personal Protective Equipment at Health Facility OPDs

Date: Venue: Group:

|  |  |
| --- | --- |
| Human Resource | Recommended PPE |
| Healthcare Workers in Consultation Room |  |
| Patient with Respiratory Symptoms in Waiting Area |  |
| Healthcare Workers in Triage Area |  |
| Healthcare Workers in Screening Area |  |
| Staff at Central Registration Point (point of entry) |  |

# **Handout 3 -** Guidelines for working of Outdoor Patient Departments/

**Objective**

 To provide guidelines for patients seeking healthcare for various ailments and operationalizing Out Patient Departments (OPDs)/ Primary Health Care Centres (PHCC) during the COVID-19 outbreak

##  Rationale

 Major hospitals are required to reduce the number of unnecessary visits of patients which can be managed at OPDs and diverting them to Primary Health Care Centres not only to reduce avoidable patient load at hospitals but also to protect these patients from unnecessary risk of getting COVID-19 infection.

##  Approach

As a general strategy the OPDs of the hospitals have been closed down/downsized to minimize disease transmission to other patients and healthcare personnel (HCP). This has negatively affected the access of the patients for services related to illnesses other than COVID-19. These guidelines have been prepared on the premise that such patients should get uninterrupted services during the current pandemic. It envisages that the OPD services for illnesses other than COVID-19 should be regulated/controlled in large hospitals and also be shifted to primary health care centres (BHUs/RHCs/Dispensaries/MCH centres/Medical centres and others) to function as an OPD of hospital and as a frontline triage mechanism at the primary care level. Medical officers of large hospitals may be shifted/rotated to the PHCC.

 Wherever possible utilization of telehealth methods (including but not limited to telephone/ mobile phone or WhatsApp or Internet) for the doctors working at PHCC will further seek specialist advice from hospitals (each large hospital to have its own catchment area) and accordingly will decide whether the patient should be referred to hospital or not. Hospital OPDs may also entertain walk in OPD patients according to local SOPs in addition to referred patients from the PHCC.

 The activation of services for non-COVID19 patients at primary care would potentially result in increased patient turn over at these facilities but nearer to the doorsteps of population, resulting in lesser mobility of the public and reduction of influx to major hospitals.

 This guidance reflects the need to

1. Ensure provision of services for illnesses other than COVID19 in OPDs of large hospitals and linking the primary care doctors with the specialists at hospitals through telemedicine where feasible (preferably all facilities to be linked through internet)
2. Identify persons with presumptive COVID-19 disease and implement a triage procedure to assign appropriate levels of care through implementation of ‘Fever clinics’
3. Reduce the burden on emergency departments and major hospital OPDs so that they can deal with COVID-19 cases and serious emergencies
4. Put in place precautionary measures for the doctors/HCPs, all of whom should go through relevant trainings programs (“We Care” and others)

## Outpatient department

 All large hospitals offering OPD service to non COVID19 patients and PHCC should develop local SOPs, in consultation with stakeholders, appropriate to their local environment but keeping in mind the general principals stated in these guidelines. Essential functional components of any OPD service should include Screening area, Registration area, Waiting area, Consultation rooms and other services like Pharmacy/labs etc.

 All OPD services should either establish a “Fever Clinic” or develop effective working linkage with any such facility in the existing premises. Fever clinics in the context of ongoing pandemic are meant to identify COVID-19 cases in early stage of disease and to reduce the risk of infection to HCPs. Every fever patient should be suspected and investigated to avoid potential spread. The medical personal at the Fever Clinic should obtain a brief history (including contact and travel history), conduct a brief examination (pulse, respiratory rate, oxygen saturation) and make a decision for onward disposal of the patient. Those with definite etiology of fever and least possibility of COVID-19 can be given necessary treatment at OPD while maintaining precautionry measures. If suspicion of COVID-19 is there than appropriate referrals and management as per protocol should be extended.

 The following general guidelines for risk assessment, use of PPE and activities may be adopted for developing local SOPs at hospital OPDs or PHCCs:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Serial No  | Setting  | Activity  | Risk  | Recommended PPE  | Remarks  |
| 1.  | Screening area  | Everyone entering the OPD/PHCC (patients, attendants/staff) should be screened for fever at this point  | Moderate Risk  | Surgical/ medical mask Gloves/Gowns  | -All patients with fever to be managed at “Fever clinic” -Everyone should be wearing face mask -Availability of sanitizers / hand disinfectants  |
|  |  |  |  |  | -Adequate space and markings for queuing with 6 feet distance  |
| 2.  | Help desk area/ Registration counter  | Provide information to patients/registration  | Moderate Risk  | Surgical/ medical mask Gloves/Gowns  | -Availability of sanitizers / hand disinfectants  |
| 4.  | Holding area/ waiting area  | Nurses/ Paramedics interacting with patients  | Moderate Risk  | Surgical/ medical mask Gloves/Gowns  | -Social distancing of 6 feet needs to be maintained while seated -Handwashing facility with soap -Display of SOPs and information materials  |
| 5.  | Doctors Chamber  | Clinical Management (Doctors & Nurses)  | Moderate Risk  | Surgical/ medical mask Glove/Gowns  | -No aerosol generating procedures should be allowed -Handwashing facility with soap  |
| 6.  | Sanitary staff  | Cleaning frequently touched surfaces/ floor/cleaning linen  | Moderate Risk  | Surgical/ medical mask Gloves/Gowns  |   |
| 7.  | Visitors accompanying young children and elderlies  | Support in navigating various services  | Low risk  | Surgical/ medical mask  | -No attendant should be allowed to accompany patients in OPD settings unless absolutely necessary -The visitors thus allowed should be screened for fever and they should practice social distancing  |

In addition, the Screening area should be at the entrance to the facility, away from patient waiting areas

* Clear sign posts should direct the patient to this area
* Measures should be taken to have hand washing facilities at the facility
* Continuous monitoring of adherence to such practices among staff and facility attendees
* Any patient who fits in to the definition of COVID-19 suspect should be managed as per the COVID19 protocols

All PHCC (BHUs/RHCs/Dispensaries/MCH centres/Medical centres and others) should develop formal linkages with the large hospitals of their catchment area. These PHCC should find separate screening area and waiting area for patients to separate the suspected COVID-19 and non-COVID19 patients. The patients who are suspected of COVID-19 should be seen by a doctor in separate room and managed as per the COVID19 protocols. The non-COVID19 patients should be seen by another doctor (if possible) in a separate room. If the doctor managing the non-COVID19 patient requires a specialist opinion, s/he should contact the relevant specialist at the hospital.

Appropriate transport/Ambulance access should be available at all PHCC and hospital OPDs in case urgent transfers/referrals are needed. The tertiary hospitals should make a duty roster for specialists to be available inhouse during OPD timings (connected to respective PHC facilities in their drainage area through internet or other telehealth options) and if circumstances permit relevant specialists should visit the designated PHCC.

### Patients Protection at OPD

* Identify a separate, well-ventilated space that allows waiting patients and additional attendants to be separated
* Place visual alerts such as signs and posters at entrances and in strategic places providing instruction on hand hygiene, respiratory hygiene, and cough etiquette
* Ensure supplies are available such as: tissue papers, hand washing facilities with soap, waste baskets, and alcohol-based hand sanitizer in readily accessible areas
* Ensure surgical/medical facemasks are available at all places for patients with respiratory symptoms
* If facility lacks a waiting area, then designated areas or waiting lines should be created by partitioning or signage.
* To reduce crowding in waiting rooms, consider asking patients waiting to be seen to remain outside (e.g., stay in their vehicles, if applicable) until they are called into the facility for their appointment or set up triage booths to screen patients safely.

### Telemedicine/Telehealth

* Where feasible PHCC will act as the OPD of hospitals while hospital OPDs remain closed/downsized to ease the burden at tertiary level hospitals and avoid spread of infection
* All PHC facilities should preferably be internet enabled or other forms of telehealth should be provided by the management

**Telehealth** has emerged as a critical tool in the fight against COVID-19. Health care personnel at PHCC should be connected to specialists at hospital for telemedicine and referral advice, in order:

* + Screen patients who need hospital services through a proper referral system
	+ Improve access to specialty expertise for patients and providers without the need for a face-to-face visit to hospital
	+ Support triage and remote management of patients

References[[32]](#endnote-30)

**Report you facilitator when you complete reading**

Group Work 3: Organizing OPD Services during COVID-19 Pandemic

 Date: Venue: Group:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Setting | Activity | Risk Level | Recommended PPE | Remarks |
| Screening Area  |  |  |  |  |
| Registration Counter  |  |  |  |  |
| Waiting Area  |  |  |  |  |
| HCP Room |  |  |  |  |
| Sanitary Staff |  |  |  |  |
| Visitors |  |  |  |  |

# **Handout - 4:** Clinical Management Guidelines for COVID-19 Infections

# Testing Criteria

## Viral Lab testing for COVID 19

Testing should be performed using RT-PCR. Preferable samples are nasopharyngeal (NP) or lower respiratory samples. Other samples include oropharyngeal and nasal samples, though these may not be as sensitive and may require 2 or more samples to avoid a false negative test.

Serology (IgM/IgG tests) are NOT recommended as primary means for diagnosis.

Symptoms will appear 2-14 days after exposure to the virus, however contact history is not required to decide on testing. Individuals with the following symptoms may qualify for testing. Respiratory symptoms alone

* Cough
* Shortness of breath or difficulty breathing

Or at least two of these symptoms

* Fever
* Chills
* Repeated shaking with chills
* Muscle pain
* Headache
* Sore throat
* New loss of taste or smell

Testing is based on symptoms and priority is given to certain individuals

* Hospitalized patients with symptoms
* Healthcare workers and workers in congregate living settings with symptoms
* Residents in long-term care facilities or other congregate living settings, including prisons, shelters and hostels, with symptoms
* Patients with radiological features suggestive of COVID even if asymptomatic or without typical symptoms
* Outpatients with symptoms of potential COVID-19 infection
* Healthcare workers without symptoms, but with a history of exposure to a COVID positive patient
* Persons without symptoms, but with a history of close contact with a COVID positive patient

 Clinical classification of suspected or confirmed COVID-19 patients

Patients can be classified into asymptomatic, mild, moderate, severe or critical based on their presentation.

**Asymptomatic**

SARS CoV2 infection but with no symptoms

## Mild

Presence of symptoms consistent with COVID as above without any hemodynamic compromise, need for oxygen or chest x-ray findings.

Oxygen saturation ≥94%

## Moderate

Hypoxia (Oxygen saturation <94% but >90%) or chest X-ray with infiltrates involving <50% of the lung fields

No complications and manifestations related to severe condition

## Severe

In adults, clinical signs of pneumonia (fever/ cough) plus, any of the following:

Respiratory rate > 30

Severe respiratory distress;

SpO2 ≤ 90% on room air.

Chest X-ray involving >50% of lung fields

## Critical

Any of the three manifestations

### ARDS

Onset: Within 1 week of a known clinical insult (i.e. pneumonia) or new or worsening respiratory symptoms.

Chest imaging: (X-ray or CT scan): bilateral opacities, not fully explained by volume overload, lobar or lung collapse, or nodules.

Origin of pulmonary infiltrates: respiratory failure not fully explained by cardiac failure or fluid overload. Need objective assessment (e.g. echocardiography) to exclude hydrostatic cause of infiltrates/edema if no risk factor presents. Oxygenation impairment in adults

* Mild ARDS: PaO2/FiO2: >200 mmHg and ≤ 300 mmHg (with PEEP or CPAP ≥ 5 cmH2O).
* Moderate ARDS: PaO2/FiO2 ≤ 200 mmHg and >100 mmHg (with PEEP≥ 5 cmH2O).
* Severe ARDS: PaO2/FiO2 ≤ 100 mmHg (with PEEP ≥ 5 cmH2O)

### 2. MULTIORGAN DYSFUNCTION

Acute life-threatening organ dysfunction caused by a dysregulated host response to suspected or proven viral or bacterial infection.

**Signs of organ dysfunction include:**

Altered mental status, difficult or fast breathing, low oxygen saturation, reduced urine output, fast heart rate, weak pulse, cold extremities or low blood pressure, skin mottling, laboratory evidence of coagulopathy, thrombocytopenia, acidosis, high lactate, or hyperbilirubinemia.

### 3. SEPTIC SHOCK

Persistent hypotension despite volume resuscitation, requiring vasopressors to maintain MAP ≥ 65 mmHg and serum lactate level > 2 mmol/L

# Criteria for admission of suspected or confirmed COVID-19 patients

## Asymptomatic and mild disease

Asymptomatic and mild cases can be managed at home with home isolation Criteria for home isolation include (must fulfill all the below)

1. Those with a separate room to stay in with a separate bathroom
2. Those consenting for isolation

Patients with mild or asymptomatic disease who do not have adequate home arrangements or do not consent to stay at home should be shifted to a dedicated isolation facility (as opposed to a hospital)

However, the following may be considered for hospital admission for observation if resources allow.

1-Immunosuppressed (on long term steroids or other immunosuppression)

2-Co-morbid conditions: Heart Failure, Decompensated Liver Disease, Structural Lung

Disease, Uncontrolled Diabetes, Chronic Kidney Disease

If the patients cannot be admitted, then clear instructions must be given to call if any worsening occurs.

## Moderate, severe and critical disease

Patients with the above categories should be admitted to a hospital for further management.

* Moderate disease: Admit to a well-ventilated general ward
* Severe disease: Admit to high dependency unit with negative pressure room
* Critical disease: Admit to ICU with negative pressure room

In all the above wards, it is mandatory that oxygen and pulse oximetry be available.

# Management

## Prophylaxis

**There is no role of prophylactic chloroquine or hydroxychloroquine at this time.** Both these drugs are being studied for treatment of COVID. The results thus far are not robust enough that either drugs can be clearly labeled as effective in treatment of COVID. Moreover, given the side- effects associated with use of chloroquine or hydroxychloroquine (especially chronic use), the limited stocks (for moderately sick) and the lack of data showing use will prevent the infection, prophylactic use is **strongly** discouraged.

## Management of mild disease

Mild cases should be treated with supportive care only. This includes acetaminophen for fever, oral hydration in case of diarrhea and antihistamines for rhinorrhea.

There is a theoretical risk with the use of NSAIDS or ACE-inhibitors in COVID-19. However, clinical data regarding this is lacking and at this point, a strong recommendation to avoid or to continue these medications cannot be made.

**No specific treatment** (including chloroquine hydroxychloroquine, azithromycin, ivermectin or, famotidine) is recommended for asymptomatic or mild disease.

### Management of moderate, severe, and critical disease

Patients with moderate disease should receive supportive therapy. All patients must be assessed for the Cytokine Release Syndrome (CRS). For this the following investigations are suggested

* CBC
* Ferritin
* C-reactive protein
* Lactate dehydrogenase
* D-Dimer
* Chest X-ray (P.A view)
* Additional investigations indicated include
* Liver function tests
* BUN Creatinine and electrolytes
* Blood cultures
* Blood glucose levels
* EKG
* Arterial Blood Gas (for severe and critical cases)
* Serum lactate (for severe and critical cases)
* Respiratory cultures (for severe and critical cases) Optional investigations include
* Procalcitonin
* Troponin
* Echo
* Pro-BNP
* IL-6
* CT scan chest

 NOTE:

Chest radiographs of patients with COVID-19 typically demonstrate bilateral air-space consolidation, though patients may have unremarkable chest radiographs early in the disease. Chest CT images from patients with COVID-19 typically demonstrate bilateral, peripheral ground glass opacities.

Because this chest CT imaging pattern is nondependent upon radiographic interpretation. Patients who present early e.g. within two days of diagnosis may have a normal CT and there might be presence of CT -specific and overlaps with other infections, the diagnostic value of chest CT imaging for COVID-19 may be low and abnormalities in patients prior to the detection of SARSfor the diagnosis of COVID-19. The American College of Radiology also does not recommend CT for screening or as a first-CoV-2 RNA. Given the variability in chest imaging findings, chest radiograph o-line test for diagnosis of COVIDr CT alone is not recommended -19.

**Specific therapy**

## Supportive care

The mainstay of management for COVID-19 is oxygen therapy via nasal cannula or face mask. If available high flow oxygen can also be used to maintain saturation. All patients with low saturations should be placed in the prone position. For those not intubated, voluntary awake prone positioning should be encouraged for as long as the patient can manage. For patients on the ventilator, 12 to 15 hours of prone positioning should be attempted.

## Steroids

All patients requiring oxygen should be started on steroids. The steroids recommended include **dexamethasone or methylprednisone**. The choice of steroid used is at the discretion of the clinician. However, dexamethasone is cheaper, easier to use in the outpatient setting and has more potent glucocorticoid (anti-inflammatory) activity). On the other hand, methylprednisone may be superior in patients in shock due to its mineralocorticoid activity.

In patients with severe and critical disease, intravenous steroids are preferred. Treatment should continue for 5 days. However, this may be prolonged in case of prolonged hypoxia.

**Dose:** 6mg per day of dexamethasone (oral or intravenous)

0.5 to 1 mg/kg/d of methyl prednisone

##  Anticoagulation

As patients with COVID-19 may be hypercoagulable, anticoagulation plays an important role in therapy. For all doses mentioned below, adjustment will be required in case of renal impairment or morbid obesity (BMI ≥ 40kg/m2)

**If the patient was already on oral anticoagulation for another indication (such as atrial fibrillation):**

* In moderate disease: Continue same
* In severe/critical: Consider switching to parenteral therapy

### If the patient was not on anticoagulation at the time of admission

* In moderate disease: Start standard DVT prophylaxis (enoxaparin 40 mg once daily once daily)
* If severe disease: Start aggressive prophylaxis (enoxaparin 40 mg every 12 hourly)

**Indications for therapeutic anticoagulation (any of the following):**

* Documented presence of thromboembolic disease (such as ultrasound doppler or CT for PE)
* Strong suspicion for thromboembolic disease when investigation cannot be done
* D-Dimers over 3 times upper limit normal

|  |  |
| --- | --- |
| Dose Enoxaparin 1mg/kg every 12 hourly Duration: 1 to 3 months (Switch to rivaroxaban on discharge if diagnosis was presumptive or based on D-dimer elevation. If documented VTE follow standard guidelines for durationRemdesivir  | **Dose adjustment** **Acute Renal Failure** Prophylaxis: Cr Cl >30 ml/min 40mg OD or BD enoxaparin Cr Cl < 30 and >15 ml/min 30mg OD or BD enoxaparin Cr Cl < 15 ml/min Unfractionated Heparin preferred Dialysis Unfractionated Heparin preferred Therapeutic: Cr Cl >30 ml/min 1 mg/kg s/c BD enoxaparin Cr Cl < 30 and >15 ml/min 1 mg/kg s/c OD enoxaparin Cr Cl < 15 ml/min Unfractionated Heparin preferred Dialysis Unfractionated Heparin preferred **Morbid Obesity (BMI ≥ 40kg/m2 )** Increase standard doses of both prophylactic and therapeutic anticoagulation by 30% |
| IndicationModerate and severe COVID requiring oxygen therapy regardless of if CRS is present. This can also be given in critical COVID, however, with the available data, it is unlikely to be of benefit in this patient population **Dose:**200 mg IV on day 1 followed by then 100 mg IV daily on days 2-5 |

##  Therapy in Cytokine Release Syndrome (CRS)

Cytokine Release Syndrome is defined as ANY of the following in the presence of moderate, severe or critical disease

1. Ferritin >1000 mcg/L and rising in last 24 hours
2. Ferritin >2000 mcg/L in patient requiring high flow oxygen or ventilation
3. Lymphopenia <800 cells/ml, or lymphocyte percentage <20% or Neutrophil to lymphocyte ratio of >5 and two of the following
4. Ferritin >700 mcg/mL and rising in the last 24 hours
5. LDH > 300 IU and rising in the last 24 hours
6. D-Dimer >1000ng/mL (or >1mcg/ml) and rising in the last 24 hours
7. CRP >70 mg/L (or >10 hsCRP) and rising in the last 24 hours, in absence of bacterial infection
8. If any 3 presents on admission no need to document rise

## Tocilizumab

Reserved for patients in whom worsening occurs despite steroids or those who present as severe/critical disease in CRS. As tocilizumab greatly increases the risk of secondary infection, only use in cases of confirmed CRS

|  |
| --- |
| **Weight-based tocilizumab dose** **Standard dosing for 80mg vial** **WEIGHT Dose(mg)** 30-50kg 320 51-70kg 480 71-90kg 640 >90kg 800  **Standard dose for prefilled syringes (IV use) 162mg/0.9 ml** **WEIGHT Dose** 30-50kg 2 syringes (324mg) 51-70 kg 3 syringes (486 mg) 71-90 kg 4 syringes (648 mg) >90 kg 5 syringes (810mg)  |

**Dose:**

4 to 8 mg/kg iv. Not over 800mg (maximum). Can repeat in 12 hours once only

**Contraindications:**

Active TB

Zoster

Sepsis and positive blood culture

Suspected GI perforation

Multiple Sclerosis

Allergy to Tocilizumab

ALT > 5 times or Bilirubin > 2

ANC <2000 or Thrombocytopenia <50

Pregnancy (relative contraindication)

## Antibiotics

Antibiotics should only be used in cases where a bacterial infection is suspected, for example in cases with an elevated white cell count (in the absence of steroid) or procalcitonin. There is no role of prophylactic antibiotics to prevent a secondary infection.

**Hydroxychloroquine and chloroquine**

These are no longer recommended given recent studies showing potential harm and lack of clear benefit.

### Investigational therapy

Other treatment modalities including (but not limited to) convalescent plasma, ivermectin or famotidine should be used only in the setting of a research protocol which includes consent and safety oversight

# Discontinuation of Isolation

There are no data regarding re-infection with SARS-CoV-2 after recovery from COVID-19. Viral RNA shedding declines with resolution of symptoms and may continue for days to weeks. However, the detection of RNA during convalescence **does not** indicate the presence of viable infectious virus.

**Isolation precautions can therefore be discontinued in the following conditions:**

* In those who are symptomatic, the following symptom-based strategy is recommended: At least 10 days from the start of symptoms AND at least 3 days after resolution of symptoms (fever and respiratory symptoms)
* In those who are asymptomatic, the following time-based strategy is recommended:

Ten days from the date of the test

**A test to document cure is not required in the above-mentioned patients.**

However, for the following two consecutive negative PCR tests a minimum of one day apart are required to discontinue isolation

* Immunocompromised patients
* Those living in congregations such as jails, dorms or madarsas (if going back to the congregation
* Healthcare workers dealing with immunocompromised patients
* Test-based isolation discontinuation may also be done on the discretion of the treating physician

*Note: The above recommendations are being regularly reviewed by the Ministry of National Health Services, Regulations & Coordination and will be updated based on the international & national recommendations and best practices.*

*The Ministry acknowledges the contribution Dr Syed Faisal Mahmood, Dr Nousheen Nasir, Dr Samreen*

*Sarfaraz, Dr Shehla Baqi, Dr Fyezah Jehan, Dr Farah Qamar, Dr Farheen Ali, Dr Ejaz Ahmed Khan, Dr Muneeba Ahsan, Dr Salma Abbas, Dr Faisal Sultan, Dr Sunil Dodani, Dr Amjad Mahboob, Dr Naseem Akhtar, Dr Asma Adil, Dr Javed Bhutta, Dr Urooj Aqeel and HSA/ HPSIU/ NIH team to compile these guidelines.*

**References[[33]](#endnote-31)**

**Report you facilitator when you complete reading**

References

1. http://www.emro.who.int/health-topics/disease-outbreaks/index.html [↑](#endnote-ref-1)
2. https://www.who.int/hac/about/definitions/en/ [↑](#endnote-ref-2)
3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4287779/ [↑](#endnote-ref-3)
4. <https://www.who.int/bulletin/volumes/89/7/11> [↑](#endnote-ref-4)
5. ILO Employment and Decent Work for Peace and Resilience Recommendation,2017 (No. 205), Art. 2(a). [↑](#endnote-ref-5)
6. United Nations, Department of Humanitarian Affairs: Internationally agreed glossary of basic terms related to Disaster Management, 1992. [↑](#endnote-ref-6)
7. United Nations General Assembly, Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction (A/71/644), 1 December 2016, p. 22 [↑](#endnote-ref-7)
8. United Nations General Assembly, Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction (A/71/644), 1 December 2016, p. 21. [↑](#endnote-ref-8)
9. <https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200321-sitrep-61-covid-19.pdf?sfvrsn=ce5ca11c_2> visited on July 13,2020 [↑](#endnote-ref-9)
10. <https://www.who.int/health-topics/coronavirus#tab=tab_1> visited on July 13,2020 [↑](#endnote-ref-10)
11. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses> visited on July 13,2020 [↑](#endnote-ref-11)
12. <https://www.cdc.gov/coronavirus/types.html> visited on July 14,2020 [↑](#endnote-ref-12)
13. [https://www.who.int/news-room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations visited on July 13,2020](https://www.who.int/news-room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations%20visited%20on%20July%2013) [↑](#endnote-ref-13)
14. <https://apps.who.int/iris/bitstream/handle/10665/112656/9789241507134_eng.pdf?sequence=1> visited on July 14,2020 [↑](#endnote-ref-14)
15. Liu J, Liao X, Qian S et al. Community transmission of severe acute respiratory syndrome coronavirus 2, Shenzhen, China, 2020. Emerg Infect Dis 2020 doi.org/10.3201/eid2606.200239 [↑](#endnote-ref-15)
16. [https://www.who.int/docs/default- source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf](https://www.who.int/docs/default-%20source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf) visited on July 14,2020 [↑](#endnote-ref-16)
17. <https://www.who.int/health-topics/coronavirus#tab=tab_3> visited on July 13,2020 [↑](#endnote-ref-17)
18. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses> visited on July 13,2020 [↑](#endnote-ref-18)
19. <https://www.who.int/health-topics/coronavirus#tab=tab_2> visited on July 13,2020 [↑](#endnote-ref-19)
20. Screening: refers to prompt identification of patients with signs and symptoms of COVID-19 [↑](#footnote-ref-1)
21. Triage: prioritization of care according to severity using validated tools (e.g., WHO/ICRC/MSF/IFRC Integrated Interagency Triage Tool) [↑](#footnote-ref-2)
22. Rational use of personal protective equipment for coronavirus disease 2019 (COVID-19). Geneva: World Health Organization; 2020 (available at : [https://apps.who.int/iris/rest/bitstreams/1274340/retriev e](https://apps.who.int/iris/rest/bitstreams/1274340/retrieve) [↑](#endnote-ref-20)
23. Clinical management of COVID-19. Geneva: World Health Organization; 2020 (available at: [https://apps.who.int/iris/rest/bitstreams/1278777/retriev e](https://apps.who.int/iris/rest/bitstreams/1278777/retrieve) [↑](#endnote-ref-21)
24. WHO guidelines on hand hygiene in health care: first global patient safety challenge – clean care is safer care. Geneva: World Health Organization; 2009 (available at: <https://apps.who.int/iris/handle/10665/44102> [↑](#endnote-ref-22)
25. Hand Hygiene: Why, How & When? Geneva: World Health Organization; 2009 (available at: [https://www.who.int/gpsc/5may/Hand\_Hygiene\_Why\_ How\_and\_When\_Brochure.pdf](https://www.who.int/gpsc/5may/Hand_Hygiene_Why_How_and_When_Brochure.pdf) [↑](#endnote-ref-23)
26. How to put on and take off personal protective equipment (PPE)*.* Geneva: World Health Organization; 2020 (available at: [https://www.who.int/csr/resources/publications/putonta keoffPPE/en/,](https://www.who.int/csr/resources/publications/putontakeoffPPE/en/) [↑](#endnote-ref-24)
27. Water, sanitation, hygiene, and waste management for the COVID-19 virus: interim guidance. Geneva: World Health Organization; 2020 (available at:

[https://apps.who.int/iris/rest/bitstreams/1275547/retriev e](https://apps.who.int/iris/rest/bitstreams/1275547/retrieve) [↑](#endnote-ref-25)
28. Advice on the use of masks in the context of COVID19. Geneva: World Health Organization; 2020 https://apps.who.int/iris/rest/bitstreams/1279750/retriev [e](https://apps.who.int/iris/rest/bitstreams/1279750/retrieve) [↑](#endnote-ref-26)
29. Telemedicine opportunities and development in member states. Geneva: World Health Organization; 2010 [https://www.who.int/goe/publications/goe\_telemedicine \_2010.pdf](https://www.who.int/goe/publications/goe_telemedicine_2010.pdf) [↑](#endnote-ref-27)
30. See PPE video on <https://openwho.org/courses/IPC-PPE-EN> [↑](#endnote-ref-28)
31. Reverences of Handout - 2

	1. WHO Interim Guide 19 March 2020/
	2. <https://apps.who.int/iris/bitstream/handle/10665/331498/WHO-2019-nCoV-IPCPPE_use-2020.2-eng.pdf>
	3. CDC Guidelines
	4. <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover.html>
	5. <https://www.cdc.gov/coronavirus/2019-ncov/if-you-are-sick/care-for-someone.html>
	6. Guidance form the Chinese Delegation (with hands-on experience) visiting Pakistan.
	7. Infection prevention and control of epidemic-and pandemic-prone acute respiratory infections in health care. Geneva: World Health Organization; 2014.
	8. Telemedicine: opportunities and developments in Member States: report on the second global survey on eHealth. Geneva: World Health Organization; 2009 (Global Observatory for eHealth Series, 2).
	9. Beckman S, Materna B, Goldmacher S, Zipprich J, D’Alessandro M, Novak D, et al. Evaluation of respiratory protection programs and practices in California hospitals during the 2009-2010 H1N1 influenza pandemic. Am J Infect Control 2013;41(11):1024-31. doi:10.1016/j.ajic.2013.05.006.
	10. Janssen L, Zhuang Z, Shaffer R. Criteria for the collection of useful respirator performance data in the workplace. J Occup Environ Hyg 2014;11(4):218–26. doi:10.1080/15459624.2013.852282
	11. Janssen LL, Nelson TJ, Cuta KT. Workplace protection factors for an N95 filtering facepiece respirator. J Occup Environ Hyg 2007;4(9):698–707. doi:10.1080/15459620701517764.
	12. Radonovich LJ Jr, Cheng J, Shenal BV, Hodgson M, Bender BS. Respirator tolerance in HCWs. JAMA 2009;301(1):36–8. doi:10.1001/jama.2008.894. [↑](#endnote-ref-29)
32. References of Handout 3

	1. Outpatient and Ambulatory Care Settings: Responding to Community Transmission of COVID-19 in the United States CDC Guidelines
	2. [https://medicaldialogues.in/medicine/guidelines/ministry-of-health-and-family-welfare-novel-coronavirus-disease2019-covid-19-guidelines-64224](https://medicaldialogues.in/medicine/guidelines/ministry-of-health-and-family-welfare-novel-coronavirus-disease-2019-covid-19-guidelines-64224)
	3. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/ambulatory-care-settings.html> [↑](#endnote-ref-30)
33. References of Handout 4

	1. Organization WH. Clinical management of severe acute respiratory infection (SARI) when COVID-19 disease is suspected: Interim guidance V 1.2. 2020 [Available from: [https://www.who.int/publications-detail/clinical- management-of-severe-acute-respiratoryinfection-when-novel-coronavirus-(ncov)-infection-is-suspected.](https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-%28ncov%29-infection-is-suspected)
	2. GautretP, Lagier JC, ParolaP, Hoang VT, MeddebL, Mailhe M, et al. Hydroxychloroquine and azithromycin as a treatment of COVID-19: results of an open-label non-randomized clinical trial. Int J Antimicrob Agents.2020:105949.
	3. Colson P, Rolain JM, LagierJC, BrouquiP, RaoultD. Chloroquine and hydroxychloroquine as available weapons to fight COVID-19. Int J AntimicrobAgents.2020:105932.
	4. CortegianiA, Ingoglia G, Ippolito M, Giarratano A, EinavS. A systematic review on the efficacy and safety of chloroquine for the treatment of COVID-19. J CritCare.2020.
	5. Gao J, Tian Z, Yang X. Breakthrough: Chloroquine phosphate has shown apparent efficacy in treatment of COVID-19 associated pneumonia in clinical studies. BiosciTrends.2020;14(1):72-3.
	6. Al-Tawfiq JA, Al-HomoudAH, MemishZA. Remdesivir as a possible therapeutic option for the COVID-19. Travel Med Infect Dis.2020:101615.
	7. Cao B, Wang Y, Wen D, Liu W, Wang J, Fan G, et al. A Trial of Lopinavir-Ritonavir in Adults Hospitalized with Severe Covid-19. N Engl J Med.2020.
	8. Liu F, Xu A, Zhang Y, Xuan W, Yan T, Pan K, et al. Patients of COVID-19 may benefit from sustained lopinavir- combined regimen and the increase of eosinophil may predict the outcome of COVID-19 progression. Int J Infect Dis. 2020.
	9. National Action Plan for Corona virus disease (COVID-19) Pakistan. In: Ministry of National HealthServices
	10. .https:[//www.nih.org.pk/wp-content/uploads/2020/03/COVID-19-NAP-V2-13-March-2020.pdf. L](http://www.nih.org.pk/wp-content/uploads/2020/03/COVID-19-NAP-V2-13-March-2020.pdf)ast accsessed 28-3-20
	11. Zhang W, Du RH, Li B, et al. Molecular and serological investigation of 2019-nCoV infected patients: implication of multiple shedding routes. Emerg Microbes Infect 2020;9:386-9.
	12. Zhao J, Yuan Q, Wang H, et al. Antibody responses to SARS-CoV-2 in patients of novel coronavirus disease 2019. Clin Infect Dis 2020.
	13. Guo L, Ren L, Yang S, et al. Profiling Early Humoral Response to Diagnose Novel Coronavirus Disease (COVID-19). Clin Infect Dis 2020. [↑](#endnote-ref-31)