COVID-19
(SARS-CoV-2 INFECTION)
GUIDE

Study of Scientific Board

Republic of Turkey, Ministry of Health
April 14th 2020, Ankara
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(SARS-CoV-2 INFECTION)
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SUMMARY OF RECENT UPDATES

» Sampling
» Contact follow-up
» Ambulance patient transport
» Patient monitoring at home
» Adult patient management in assigned COVID-19 outpatient clinic
» COVID-19 adult patient treatment
» Supportive therapy in COVID-19 patients
» COVID-19 pediatric patient management and treatment
» Evaluation of contact health workers
» Morgue and burial services
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INTRODUCTION

Coronaviruses (CoV) are a large family of viruses causing mild infections such as cold, which is observed generally in the society and self-limiting, to more severe infections such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS).

There are several subtypes of coronaviruses that can be easily transmitted from human to human (HCoV-229E, HCoV-OC43, HCoV-NL63 and HKU1-CoV). These subtypes that circulate among humans are mostly viruses that cause colds. However, there are many coronavirus subtypes detected in animals, and it is known that these viruses can be transmitted from animals to humans and cause severe disease settings in humans. As a result of detailed researches, it has been revealed that SARS-CoV is transmitted from bearcats and MERS-CoV is transmitted from dromedary camels to humans.

SARS-CoV emerged as a previously unknown virus in 2003 as the first international health emergency of the 21st century, causing hundreds of people to lose their lives. About 10 years later, MERS-CoV from the coronavirus family, which has not been previously demonstrated in humans or animals, was first described in humans in Saudi Arabia in September 2012; however, it was later revealed that the first cases were actually observed in a hospital in Zarqa, Jordan in April 2012.

On December 31, 2019, the World Health Organization (WHO) China Country Office reported pneumonia cases of unknown etiology in Wuhan, China’s Hubei province. On January 7, 2020, the causative agent was identified as a novel coronavirus (2019- nCoV) that has not previously been detected in humans. Later, the name of the 2019-nCoV disease was accepted as COVID-19, and the virus was named as SARS-CoV-2 because of its close resemblance to SARS CoV.

This guide provides information about COVID-19, its agent, modes of transmission, case definitions and diagnostic methods, and also, to guide the strategy and application forms that should be followed in case of COVID-19 case or contact. This guideline was created mainly in line with WHO recommendations. The “COVID-19 (2019-nCoV Disease) Guide” prepared for COVID-19 is updated in line with current WHO recommendations and scientific developments. The updated guideline document and guide presentations, posters, brochures, and frequently asked questions and answers are regularly published on the TURKISH MINISTRY OF HEALTH, NOVEL CORONAVIRUS COVID-19 website (https://covid19.saglik.gov.tr/).
1. GENERAL INFORMATION

1.1. Coronavirus

Coronaviruses are single-chain, positive polarity, enveloped RNA viruses. As they have positive polarity, they do not contain RNA-dependent RNA polymerase enzymes, but in their genomes, they encode this enzyme. They have rodlike extensions on their surfaces.

These protrusions are based on the meaning of "corona," in other words, "crown" in Latin. It is called Coronavirus (Crowned Virus) (Figures 1 and 2).

![Figure 1. Schematic structure of coronavirus](source)


**Figure 2. Electron microscope image of Novel Coronavirus (beta coronavirus)**

![Figure 2. Electron microscope image of Novel Coronavirus (beta coronavirus)](source)

**Source:** https://www.gisaid.org/, last accessed on: 20.01.2020

Coronaviruses are in the *Coronaviridae* family, *Orthocoronavirinae* sub-family. Orthocoronovirinae sub-family is classified into four species and a number of subspecies below these species: Alpha, Beta, Gamma, and Deltacoronavirus subspecies. Viruses under these species can be found in humans, bats, pigs, cats, dogs, rodents, and poultry (in
domestic and wild animals).

Disease spectrum caused by a coronavirus in humans can range from simple colds to the severe acute respiratory syndrome. It can cause clinical manifestations in humans and animals with various degrees of respiratory, enteric, hepatic, nephrotic, and neurological involvements.

With the combination of Sanger sequencing, Illumina sequencing, and nanopore sequencing, the first complete genome of the new species of coronaviruses was identified and three different strains were identified in bronchoalveolar lavage fluid samples.

This virus has the typical features of the Coronavirus family and is in the Betacoronavirus 2b line. The genomes of these strains and Betacoronaviruses have been shown to be closely related to bat SARS-like Coronavirus isolate Bat-SL-CoVZC45 (Figure 3).

Figure 3. Phylogenetic relationship of the new Coronavirus

![Phylogenetic tree of new Coronavirus](image)

Source: Tan W, Zhao W, Ma X, et al. A Novel Coronavirus Genome Identified in a Cluster of Pneumonia Cases — Wuhan, China 2019–2020, Notes from the Field, China CDC Weekly

The virus responsible for COVID-19 is located under the Sarbecovirus subspecies in the Betacoronavirus species, which it contains in SARS-CoV and MERS-CoV. The new nomenclature of the virus has been accepted as SARS-CoV-2.

1.2. Epidemiology

Cases of pneumonia of unknown etiology were reported on December 31, 2019, in Wuhan City, Hubei Province, China. It is stated that there is a cluster in the employees of Wuhan South China Seafood City Market (a wholesale fish and livestock market that sells different animal species) in the south of Wuhan. Findings consistent with fever, shortness of breath, and radiological bilateral lung pneumonic infiltration were detected in cases. According to WHO's COVID-19 report of the People's Republic of China, death cases were generally individuals with advanced age or concomitant systemic diseases (hypertension, diabetes, cardiovascular disease, cancer, chronic lung diseases, and other immunosuppressive conditions).

The first imported case is a 61-year-old Chinese woman reported from Thailand on January 13, 2020. As the number of countries that reported imported cases increased steadily in the
following days, countries with domestic contamination began to emerge in late February. As of the beginning of March 2020, while the pandemic in China slowed down, COVID-19 cases and related deaths are increasing rapidly in Iran, the Republic of Korea (South Korea) and Italy. As of the beginning of March 2020, more than 100 countries have been reported worldwide. Current data can be reached in WHO's https://www.who.int/emergencies/diseases/novel-coronavirus-2019 and General Directorate of Health Services for Borders and Coasts of Turkey https://www.seyahatsagligi.gov.tr/site/koronavirus addresses.

The factor of the pneumonia cluster detected on 31 December 2019 was identified on January 7, 2020, as a novel coronavirus not previously detected in humans. After this date, the number of patients increased rapidly, and the disease was observed in healthcare workers as well. The disease has spread rapidly due to its ability to contaminate among person to person.

The first COVID-19 case in our country was detected on March 11, 2020.
2. **COVID-19**

2.1. **Source**

It has not been clarified yet.

The origin of SARS-CoV-2 is still under investigation. The available data indicate wild animals sold illegally in the Huanan Seafood Wholesale Market.

2.2. **Transmission**

The disease is mainly transmitted by droplets. In addition, it is transmitted by the droplets that are brought out by coughing and sneezing by sick individuals, after they come into contact with the hands of other people, through bringing their hands to the mouth, nose or eye mucosa and contact.

Asymptomatic people may also be contagious because the virus can be detected in respiratory secretions.

When the epidemiological characteristics of the cases in China were examined, it was observed that, in some cases, the average incubation period was 5-6 days (2-14 days). In some cases, it could be extended up to 14 days.

The contamination period of COVID-19 is not exactly known. It is thought that it starts 1-2 days before the symptomatic period and ends with the disappearance of the symptoms.

Coronaviruses are generally viruses that are not very resistant to the external environment. There is an endurance period that varies according to the humidity and temperature of the environment, the amount of organic matter it is expelled, and the texture of the surface it contaminates. It is generally accepted that it loses its activity within a few hours on abiotic surfaces. When interpreting the activity time on abiotic surfaces, it should be remembered that not only the activity of the virus continues but also the duration of the contact is of importance as well.

Today, the contamination period of the SARS-CoV-2 and the period of enduring to the external environment are not clearly known.

2.3. **Clinical Features**

Common symptoms of infection are respiratory symptoms, fever, cough, and dyspnea. In more severe cases, pneumonia, severe acute respiratory infection, kidney failure, and even death may develop.
While the fatality rate was 11% in the SARS outbreak and 35-50% in MERS-CoV, the fatality rate was reported as 3.8%, according to the WHO report of the People's Republic of China.

Although it is considered that it may be mild in the first impressions due to the presence of asymptomatic cases, follow-up should be continued.

2.4. Laboratory Tests

Respiratory samples of the patients consistent with the probable case definition of COVID-19 are evaluated in terms of SARS-CoV-2 in the General Directorate of Public Health (HSGM) Microbiology Reference Laboratory and the laboratories providing service in the authorized provinces (https://covid19bilgi.saglik.gov.tr/tr/covid). Considering that coinfections may occur even if other respiratory pathogens are detected in the patient, all patient samples conforming to the probable case definition of COVID-19 should also be evaluated for SARS-CoV-2.

2.4.1. Nucleic acid amplification tests (NAAT)

Routine validation of COVID-19 cases by Nucleic acid amplification tests (NAAT) for SARS-CoV-2 virus, is based on detection of specific sequences of virus RNA with a NAAT test such as real-time reverse transcription-polymerase chain reaction (rRT-PCR) and nucleic acid sequence analysis method, when necessary. RNA extraction should be performed in BSL-2 or equivalent biosafety cabinet. It is not recommended to warm up samples before RNA extraction.

Although different protocols targeting the N, E, and S genes for molecular tests have been published so far, a simpler algorithm such as rRT-PCR scanning with a single descriptive targeted as sample, is sufficient where the SARS-CoV-2 virus is commonly observed. The possibility of COVID-19 virus infection cannot be excluded with one or more negative results. The following factors can cause a negative result in the infected individual:

» Poor quality sample with a scarce patient material

» Collecting the sample in a too early or late phase of infection,

» Not processing and transferring the sample properly,

» Technical causes inherent in the test, such as PCR inhibition or virus mutation
When a negative result is obtained from a patient with a high suspicion of COVID-19 infection, additional samples containing lower respiratory tract samples should be collected and studied, if possible, especially if only the upper respiratory tract samples have been collected from the patient.

2.4.2. Sequencing

Sequence data is essential to understand the origin of the virus and how it has spread. The WHO reported that laboratories should necessarily share their sequencing data on relevant platforms (GenBank, GISAID, etc.).

2.4.3. Serological tests

In cases where NAAT tests are negative and that there is a strong epidemiological link to a COVID-19 infection, the study of serological tests in serum samples taken in the acute and/or convalescent-phase may support the diagnosis. For this purpose, serological tests such as rapid antibody tests that detect ELISA or IgM/IgG are currently used. In addition to this, serological tests help investigate the ongoing outbreak and provide a retrospective evaluation of the attack rate and severity of the outbreak.
3. **CASE DEFINITION AND CASE MANAGEMENT**

3.1. **Probable case**

A:

» At least one of the signs and symptoms of fever or acute respiratory disease (cough and respiratory distress), AND

» Inability to explain the clinical manifestation with another cause/disease AND

» A history of himself or his / her relative being abroad within 14 days before the onset of symptoms

OR

B:

» At least one of the signs and symptoms of fever or acute respiratory disease (cough and respiratory distress), AND

» Close contact with the confirmed COVID-19 case within 14 days prior to the onset of symptoms

OR

C:

» At least one of the signs and symptoms of fever and severe acute respiratory infection (cough and respiratory distress), AND

» Presence of hospitalization requirement (SARI) * AND

» Failure to explain the clinical manifestation with another cause / disease

* SARI (Severe Acute Respiratory Infections) in a patient with acute respiratory infection developing in the past 14 days, hospitalization due to fever, cough and dyspnea, follow-up, hypoxemia, hypotension, widespread radiological finding in lung screening and changes in consciousness.

OR

D:

» Cough or shortness of breath with a sudden start of fever and no nasal discharge

3.2. **Confirmed Case**

» Among the cases that meet the definition of a probable case, cases with SARS-CoV-2 detected by molecular methods.
Management of probable / confirmed COVID-19 cases is conducted according to the Case Follow-up Algorithm.

**COVID-19 CASE FOLLOW-UP ALGORITHM**

**PROBABLE CASE**
Once defined, the Provincial Health Directorate Communicable Diseases Unit is informed. The management of the case is carried out under the coordination of the Provincial Health Directorate.

**HEALTH INSTITUTION**
- In each inpatient treatment institution, the personnel who will register the case to the HSYS (Public Health Management System) system and monitor the registered cases on a daily bases are designated.
- All cases matching the COVID-19 probable case definition are notified to the E-Pulse(e-nabız) through the Hospital Information Management System (HBYS) with the ICD 10 diagnosis code U07.3 within the scope of the Communicable Diseases Reporting System.
- All cases are recorded in the Public Health Management System (HSYS) starting from the probable case.
- By taking the proper sample* from the cases, the COVID-19 examination order is conducted over HSYS.
- The sample, which is ordered through HSYS, is sent to the relevant laboratory in immediate manner by Provincial Health Directorate or according to the procedure determined by the Health Directorate.
- Probable/confirmed cases are admitted and treated by isolating in Pandemic Hospitals (Ministry of Health hospitals, State and Foundation University hospitals, and private hospitals).
- The treatment and follow-up process of the cases is carried out in Pandemic Hospitals or at home following the evaluation of the physician.
- In accordance with the Pandemic Plan prepared on the basis of provinces and hospitals, it is essential to follow up confirmed and probable cases in the hospital, service, and intensive care units reserved for these patients. It should be ensured that patients are monitored in these units as isolated, if not at least 1 to 1.5 meters apart.
- In places where there are no pandemic hospitals, hospitals that have a level 2 adult intensive care unit also serve as a pandemic hospital.

**PROVINCIAL DIRECTORATE OF HEALTH**
- It ensures that samples taken from inpatient treatment institutions are sent to the relevant laboratories immediately and under proper conditions.
- In case of case cluster suspicion, the epidemiological connection between cases is investigated.
- Contact inquiries of all cases entered into HSYS, creating contact lists, and entering the HSYS system are provided.
- Daily follow-up status information of the cases registered in HSYS and hospitalized are followed.
- The follow-up status of the persons coming from abroad, who are registered as a probable case due to the confirmed case contact and decided to be followed at home, is monitored by Family Medicine.
- Contact follow-ups and positive case follow-up by the field teams are coordinated and daily follow-up is conducted.
- The follow-up of the people coming from abroad and who are decided to follow up collectively in certain regions is coordinated and the daily follow-up is conducted.

**LABORATORIES**
Samples delivered by ISM (Provincial Directorate of Health) are analyzed and their results are entered in LBYS (Laboratory Information Management System).
(The results in LBYS are automatically transferred to HSYS (Public Health Management System) as soon as they are approved. The examination results are shown on a case-by-case basis to the institutions where the order is made and users in HSYS-Public Health Management System limited to their individual area of authorization.)

* The sample is taken as a respiratory tract swab with the Viral Transport Media (VTM). If tracheal aspirate, bronchoscopic sample, sputum is to be taken, 2-3 ml should be taken in sterile, screw cap, and leakproof containers. All samples should be stored in the refrigerator (between 2-8°C) immediately after being collected and should be delivered to the laboratory immediately.
4. COVID-19 CASE MANAGEMENT IN AIRPLANES

International flights are completely halted, and limited flight program is applied in our country.

If all passengers arriving in our country by air develop symptoms, they are informed by the Directorate General of Health Services for Borders and Coasts of Turkey regarding how they will benefit from health services in our country.

People who are detected on the plane or airport and comply with the probable case definition are managed according to the algorithm below.

**IF THE PATIENTS WITH SYMPTOM IS DETECTED IN THE FLIGHT**

- The case is reported to the tower by the pilot.
- The incident is reported to the airport health inspection center/airport operation center by the tower.
- All passengers are filled with a passenger contact information card.
- Two front, two rear and two side seat passenger information is received.
- The Health Inspection Center evaluates the case on the plane.
- The Health Inspection Center provides information to the Provincial Health Directorate and 112 Command and Control Centers.
- Procedures for infectious diseases recommended by the National / International Civil Aviation authorities and organizations are implemented.
- After the Health Inspection Center evaluates the case, it delivers the case to the 112 Emergency Health Services team.
- The case is transferred to hospitals with multidisciplinary conditions through 112 Emergency Health Services ambulances.
- The patient is managed here in accordance with the Possible Case Follow-up Algorithm.

**PATIENT WITH SYMPTOM Detected in the airport**

If detected at the airport

At the earliest possible points at the international arrivals terminal, a thermal camera system is installed (at least two personnel with a trained medical mask, non-sterile gloves, and goggles must be present at the thermal imager).

a. Persons with fever detected in the thermal imager; or
b. Aircraft waiting, rest, etc. within the airport. people who have a fever and/or respiratory symptoms in their area; are ensured to wear a medical mask.

1. In cases that meet the definition of a probable case;
   - The person is taken to the Health Inspection Center.
   - The person is evaluated by the Health Audit Center staff.
   - Persons who comply with the probable case definition are informed to the Provincial Health Directorate and 112 Command and Control Centers and transferred to the hospital through 112 Emergency Health Services.
   - 112 Emergency Health Services transfer to hospitals with proper multidisciplinary conditions.
   - By contacting the airline from which the person comes, two front, two rear, and two side seat passenger information are obtained and forwarded to the Provincial Health Directorate for contact follow-up.
   - It is managed in accordance with the Case Follow-up Algorithm.
   - The sample result is reported to the Health Inspection Center by the Communicable Diseases Unit of the Provincial Health Directorate.
   - Information on probable case is reported to the Provincial Health Directorate daily.

2. In cases that do not comply with the probable case definition;
   - The transit passenger is allowed in his flight upon being informed.
   - General information is provided by keeping the records of people other than transit passengers, and they are allowed to enter the country.
5. COLLECTION, STORAGE AND TRANSPORT OF SAMPLES

5.1. Sampling
Tracheal aspirate or bronchoscopic samples should be preferred for samples to be taken from the lower respiratory tract. A nasopharyngeal wash sample or a nasal and/or oropharyngeal swab should be sent together in cases where the sample cannot be collected from the lower respiratory tract or in cases without lower respiratory symptoms. Ideally, the oropharyngeal swab should be taken first; then, it is recommended to take a nasal sample using the same swab and place it on the same transport medium. The oropharyngeal and nasal swab samples taken from the same patient should not be sent in separate mediums.

Respiratory samples should be taken from probable or confirmed COVID-19 cases by assigned medical personnel. Firstly, the health personnel assigned in that regard should be trained by those who are experienced in the prevention and control of infections (such as Infectious Diseases Specialist or Infection Control Nurses) on infection control measures, use of personal protective equipment, and proper sampling. The personnel should be assigned after the training.

The fact that the first sample taken is a sample from the upper respiratory tract and that the result is negative does not exclude the suspicion of COVID-19 infection in individuals conforming to the definition of the probable case and those whose infection findings continue becoming more severe.

5.2. Safety procedures during sample-taking and transport
» All samples taken should be considered potentially infectious, sampling should be considered as the process that causes aerosolization and individuals should use personal protective equipment (at least N95/FFP2 mask, goggles or face protection).

» In addition, those who take and send samples should send the samples in accordance with the cold chain rules with the triple transport system, following the infection prevention and control procedures.

» It should be ensured that samples are properly labeled, order forms are filled correctly, and clinical information is provided.

» Good communication should be established with the laboratory, and information should be obtained when needed.

» The laboratory must be informed before sending samples.

» As for sample waste, medical waste regulation requirements are applied.
5.3. Information required to be recorded

- Patient information - name, date of birth, gender, residence address, contact information, barcode number, etc. **also the name of the risky area one visited** and other necessary information (e.g., hospital number, hospital name, address, doctor's name contact information)
- Date and time of sample collected
- Anatomical site and location of sample collection
- Ordered tests
- Clinical symptoms and related patient information (epidemiological information, risk factors, vaccination status, and antimicrobial treatments)

Figure 4. Collection of throat swab

Figure 5. Collection of nasal swab

6. FOLLOW-UP OF THE CONTACT EXCEPT FOR THE HEALTHCARE WORKERS

Persons who have had close contact with a person who has a confirmed or probable COVID-19 infection without taking protective measures for droplet infection, should be followed up through questioning on the phone especially in terms of fever and respiratory symptoms and home visit should be made if necessary, for 14 days following their latest contact. Contact follow-up is organized and executed by the Provincial/District Health Directorate.

Healthcare workers with a contact is followed up according to the algorithm of “Evaluation of Healthcare Workers with Contact”.

6.1. Actions to be taken for the contact in case of probable COVID-19 case detection

When a person with a probable COVID-19 infection is detected;

1. Contacted persons and their contact characteristics (whether there is a close contact criterion) are determined, and their contact information is recorded.

2. If the PCR result of the possible case is negative;
   a. No precautions are taken for the contacted ones.
   b. Close contacts; they continue to work with the mask and are informed about 14 days to follow themselves up in terms of fever and respiratory symptoms.

3. If the test result is negative, no action is taken on the contacted ones.

4. If the test result is positive;
   a. Close contacts; are followed at home for 14 days in accordance with contact algorithms for fever and/or respiratory symptoms, and are informed verbally and in writing, and their consent is obtained. Active monitoring (by phone or visit) can be conducted if necessary.
   b. Contacts continue to work with the mask and are informed about 14 days to follow themselves up in terms of fever and respiratory symptoms.
   c. If fever and/or respiratory symptoms (cough, shortness of breath) develop in contacts or close contacts during the 14-day follow-up period, (surgical mask) it must be provided him/her to apply to the healthcare facility wearing a medical mask. Patients applying to the health institution are managed according to the possible case algorithm.
6.1.1. Close Contacts

» Persons with health care center related exposure such as providing direct care to a confirmed or probable case without taking measures for droplet infection, ones working with COVID-19 infected healthcare providers or visiting the patients infected with COVID-19

» Students and teachers sharing the same class with preschoolers and schoolchildren with COVID-19

» Ones who shared the same room with COVID-19 patients in the dorm or hotel

» Ones who have direct contact with COVID-19 patient (e.g., shaking hands)

» Ones who are exposed to COVID-19 patient's secretions (saliva, sputum, etc.) unprotected

» Ones who have been exposed face-to-face to COVID-19 patients for more than 15 minutes at a distance of less than 1 meter

» Ones who are closer than 1 meter and stay together for 15 minutes or more in the same indoor environment (hospital or bank lounges, buses, services, etc.) with the COVID-19 patient.

» Passengers traveling on the same plane as the COVID-19 patient sitting in two front, two rear and two side seats

» Ones living in the same house with COVID-19 patient

» Ones working in the same office with COVID-19 patient

6.1.2. Contact

» Ones who have been in the same indoor environment (hospital or bank lounges, buses, shuttle, etc. vehicles) more than 1 meter away with the COVID-19 patient.

» Ones who have been in the same indoor environment (hospital or bank lounges, buses, services, etc.) for less than 15 minutes with the COVID-19 patient.

» Ones who have been exposed to COVID-19 patients face-to-face in less than 1 meter in less than 15 minutes.

» Ones who have stayed for more than 15 minutes wearing a mask in the same indoor environment with the COVID-19 patient
6.1.3. **Contacts in a Flight**

» Passengers who have travelled in the two front, two rear, and two side seats on the same aircraft with COVID-19 confirmed or probable diagnosis cases, should be followed up for up to two weeks after contact.

The follow-up of the contacted persons should be carried out in accordance with the contacted follow-up.

<table>
<thead>
<tr>
<th>ALGORITHM OF THE CONTACTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The Provincial Health Directorate detects all the ones conforming to close contacts and the airplane contacts definition.</td>
</tr>
<tr>
<td>• Identified persons are listed and followed up by phone for 14 days after their last contact.</td>
</tr>
<tr>
<td>• The contacts should be followed up especially in terms of fever and respiratory symptoms; however, these individuals should be followed up by phone daily and should be visited at home if necessary, with regards to tremors, body aches, sore throat, headache, diarrhea, nausea/vomiting, and other symptoms.</td>
</tr>
<tr>
<td>• In order to review the contacts, the “Contact Follow-up Form” on the HSGM (General Directorate of Public Health) official website is filled in for each contact of the case.</td>
</tr>
<tr>
<td>• The contacts continue to work with the mask and are informed to follow themselves up about 14 days in terms of fever and respiratory symptoms.</td>
</tr>
<tr>
<td>• If close contacts are not required to be hospitalized for any other reason, they are asked to stay home for 14 days and stay away from public areas. In cases where it is necessary for them to go to the public areas, it is requested him/her to wear a mask.</td>
</tr>
<tr>
<td>• If symptoms develop, act in accordance with the Probable Case Algorithm.</td>
</tr>
<tr>
<td>• If the person is a healthcare worker, the follow-up is made according to the algorithm of “Evaluation of Healthcare Workers with Contact”.</td>
</tr>
</tbody>
</table>
7. INFECTION CONTROL AND ISOLATION

Isolation measures should be continued during the patient's stay in the healthcare facility, since the period of virus excretion and infectious period is not known as of today.

COVID-19 is thought to be of zoonotic origin, and human-to-human transmission is shown in the latest data. For this reason, **standard, droplet, and contact isolation measures should be taken in cases where the presence of COVID-19 is considered.**

7.1. Hospitalization

» Probable/confirmed cases are admitted and treated in Pandemic Hospitals (Ministry of Health hospitals, State and Foundation University hospitals and private hospitals) in isolation.

» The treatment and follow-up process of the cases is conducted in Pandemic Hospitals or at home following the evaluation of the physician.

» In accordance with the Pandemic Plan made on the base of provinces and hospitals, it is essential that confirmed and probable cases are followed up in the hospital, service, and intensive care units reserved for these patients. It should be ensured that patients are monitored in these units as isolated, if not at least 1 to 1.5 meters apart.

» In places where pandemic hospitals are not available, hospitals that have level 2 intensive care units also serve as pandemic hospitals.

Standard infection prevention and control measures should be applied in healthcare facilities. In addition to this, the application of contact and droplet protection measures should be continued until the patient becomes asymptomatic.

The following infection prevention and control measures should be applied to prevent the spread/transmission of the disease at the healthcare facility.

The following personal protective equipment required for personnel who will be in close contact with the confirmed / probable COVID-19 cases in less than 1 meter;

1. Gloves,
2. Aprons (non-sterile, preferably fluid-resistant and long-sleeved),
3. Medical mask (surgical mask),
4. At least N95 / FFP2 mask (Only during the process that causes aerosolization) *,
5. Face protector,
6. Goggles **
7. Liquid soap,
8. Alcohol-based hand antiseptic,

A sufficient amount of the above-mentioned materials should be kept available by inpatient health institutions.

Overalls, bonnet, foot protection can be used by deciding, depending on the patient, especially in cases where intensive contact with the bodily fluid and secretions of the patient can occur.

**Recommendations for the use of Personal Protective Equipment**


* The procedure that causes aerosolization; aspiration, bronchoscopy and bronchoscopic procedures, procedures requiring intensive contact with respiratory secretions such as, intubation, endoscopy, respiratory sampling

**Reusable goggles are cleaned according to the manufacturer’s recommendation. If there is no specific recommendation, it should be disinfected with 70% ethyl alcohol and allowed for self-drying in an appropriate environment. If goggles are to be reused, the health institution instructs on where the goggles will be removed, stored and disinfected.**

7.2. Features of Patient Room

1. Standard, contact, and droplet precautions should be taken during the hospitalization of probable or confirmed COVID-19 cases.

2. Patients should, if possible, be in a single room, with a private bathroom and toilet, and with a closable door.

3. In the absence of single rooms, confirmed COVID-19 cases can be cohorted in the same room, but it is preferable to hospitalize probable COVID-19 cases separately. In compulsory cases, probable COVID-19 cases should be placed in the same room with patient beds at least 1m apart. Probable patients included in the cohort should wear a medical mask.

4. The medical materials to be used must be patient-specific and must not be taken out of the room. The use of common materials among the patient should not be allowed. If the equipment (e.g. stethoscope, thermometer) is used for more than one patient, equipment should be cleaned and disinfected after each use (e.g., ethyl alcohol
5. Transport of patients from the room or another area should be avoided unless medically necessary. Portable X-ray equipment and/or other important diagnostic devices specified for probable COVID-19 patients should be used. However, if there are no portable diagnostic devices, the patient should be taken as the last case to minimize contact with other patients and visitors, if possible, and the patient should wear a medical mask and contact and droplet isolation measures should be taken.

6. The healthcare personnel working on the transportation of the patient should carry out this procedure with a medical mask, apron, gloves, and hand hygiene should be followed. According to the general condition of the patient, if there is a condition that can cause aerosolization, at least N95/FFP2 mask, and goggles should be kept readily available.

7. The patient environment should be cleaned and disinfected according to the rules determined in accordance with the directives of the infection control committees of the hospitals.

8. In order to dispose of used personal protective equipment, two separate medical waste should be kept outside and inside the patient room.

### 7.3. Entering Patient Room and Approaching to Patient

1. Access to the patient room should be restricted, only the personnel responsible for the patient's care and necessary to enter the room should be allowed to enter the room, patient visitors should be prohibited, and the hospital attendant, if necessary, should be restricted to one person.

2. At the entrance of the patient room, personal protective equipment (gloves, aprons (non-sterile, preferably fluid-resistant and long-sleeved), medical mask, at least N95/FFP2 mask, face protector, goggles/face protector, alcohol-based hand antiseptic and alcohol-based rapid surface disinfectant) should be available.

3. People who conduct the examination, treatment, and personal care should wear gloves, isolation aprons, goggles/face protectors, and medical masks. Gloves, isolation aprons, N95/FFP2 masks, and face shields should be used when an intervention causing patient secretions or aerosolization of body secretion is to be made.

4. While wearing and removing personal protective equipment, they should be worn (apron, mask, goggles, face protector, and gloves) and be taken off (gloves, goggles, face protectors, aprons, masks) in an appropriate order. Especially, masks should be taken off lastly after leaving the patient's room, and hand hygiene rules should be followed.

5. In cases where the integrity of the glove is impaired, and the glove is noticeably contaminated, the glove should be removed, and hand hygiene should be followed, and new gloves should be worn.
6. During the procedures that may cause aerosolization, nobody other than the healthcare personnel who are necessary should be in the patient room. During the procedure, the door should be closed, and the door should not be opened for a while after the procedure, including entries and exits. Relevant procedures should be carried out in sufficiently ventilated rooms with natural airflow, and if possible, with negative pressure.

7. Hand hygiene should be followed before and after contact with the patient. For hand hygiene, soap and water or alcohol-based hand antiseptics can be used. If the hands are noticeably dirty, soap with water should be used instead of hand antiseptics.

8. The patient should not be taken out of the room unless there is a medically important reason. If it is necessary for the patient to leave the room, the transfer should be made by masking the patient.

9. If the patient is under noninvasive or invasive respiratory support treatment, respiratory isolation measures should be followed and at least N95/FFP2 mask should be worn instead of medical masks.

10. The setting and environment of the patient should be cleaned and disinfected according to the rules determined in accordance with the directives of the infection control committees.

11. Surfaces contaminated with patient excreta and secretions should be cleaned in accordance with the "Guidelines for Protection of Infectious Diseases in Pre-Hospital Emergency Health Services".

12. After the patient is discharged, a new patient can be taken to the room after the room is cleaned and ventilated, and the ground and surfaces are disinfected.

7.4. Patient Transfer by Ambulance
1. Personal protective equipment should be kept readily available in ambulances.

2. The first responder team should wear personal protective equipment until the patient is delivered to the health institution and until the ambulance is cleaned.

3. Outpatients in good general conditions should wear medical masks and also ambulance personnel should be wearing medical masks and goggles/face protectors.

4. In the case of any patients with uncontrollable coughing or possible need of aspiration, at least N95/FFP2 masks, overalls/gowns, and goggles/face protectors should be worn.

5. Ambulances should be cleaned and disinfected after transferring probable/confirmed COVID-19 cases. The ambulance should be cleaned by wearing personal protective equipment.
6. After transferring the patient to the destination, the vehicle should also be cleaned and disinfected at the destination.

7. The cleaning and disinfection should be made in accordance with the "Guidelines for Protection of Infectious Diseases in Pre-Hospital Emergency Health Services".

8. The ambulance must not be dispatched to any other case before it is cleaned and disinfected.

9. The following questions should be considered before dispatching the ambulance to a case:

**Triage questions of 112 command control centers***

1. Do you have a cough?
2. Do you have breathing difficulties/respiratory problems?
3. Do you have fever or history of fever?
4. Have any of your relatives been hospitalized due to a respiratory disease within the last 14 days?
5. Have any of your relatives been diagnosed with COVID-19 disease within the last 14 days?

* All these questions are asked, and if the answer is yes to at least 2 of them, the case is considered as a Probable COVID-19. If the answer to the first two questions is YES, 112 personnel should wear N95/FFP2 mask and goggles/face protectors, medical masks and goggles/face protectors will be sufficient for other cases. No attendants are allowed for adult patients, and if attendants are necessary for child patients, they should wear a surgical mask.

If it is necessary to intervene to probable/confirmed COVID-19 cases, a bacteria/virus filter should be placed between the mask and bag in ambu, if possible. If it is necessary to use the ventilator, a filter should be installed on the exhalation line, and if it is not possible, then a bacteria/virus filter should be placed between the endotracheal tube and circuit at least, if possible.
8. PATIENT MONITORING AT HOME

Any probable/confirmed COVID-19 cases under the age of 50, who do not require hospitalization, or do not manifest any risk factors that may cause a severe course of COVID-19 (i.e. hypertension, diabetes, chronic lung disease, chronic heart disease, chronic renal failure or immunodeficiency), or who do not have any of the bad prognostic factors (i.e. lymphocyte count in blood <800/μl, serum CRP>40 mg/l, ferritin >500ng/ml, D-Dimer >1000 ng/ml) should start treatment and be monitored at home until the symptoms recover. However, any individuals with social indications (i.e. limited number of rooms at home or inappropriate conditions with a high number of inhabitants, or if the patient is considered to have problems to comply with isolation rules, or if an individual is >65 years old/ or if there is anybody who has a risk factor for severe COVID-19 living in the same house) may be monitored at the hospital upon the decision of the physician.

Hospitalized patients who fit the discharge criteria may also complete their recovery process at home.

The patient should be provided with medication for COVID-19 and a sufficient number of masks by the hospital during discharge. Case Status of the patient on HSYS should be updated to “Discharged, Home Follow-Up” by the HSYS user upon discharge.

Azithromycin should not be preferred in-home patients due to its probable cardiotoxicity in combination with hydroxychloroquine.

1. Home patients should be monitored by the family practitioner until healed. Medical information about the patient should be shared with the family practitioner.
2. The necessary actions during the follow-up period at home and any possible criminal responsibilities should be explained to the patient, who shall sign a consent form specifying the same.
3. The patient should spend the follow-up period at home.
4. No visitors should be allowed.
5. The patient should wear medical masks if it is necessary to share the same environment with other person(s).
6. Home patient(s) should stay in rooms apart from others if possible, to prevent the risk of transmission to household members. If this is not possible, patients should stay in a well-ventilated room and at least 1 meter away from others and wear a medical mask, which should be replaced once dampened. Patients should not be at the same home or should minimize the risk of contact with whom have risk factors that can cause a severe course of COVID-19 or who are >65 years of age living in the same house.
7. The movements of the patient in the house should be limited as much as possible.
8. The patient should use separate bathrooms and toilets, if possible.
9. Shared toilets and bathrooms should be well-ventilated and cleaned with diluted bleach (1:100 normal dilution) (sodium hypochlorite Cas No: 7681-52-9) at least once a day.

10. Patients and relatives should be trained about respiration hygiene (mouth should be covered up with a tissue (preferably single-use paper tissue) while coughing or sneezing and used tissues should be disposed of in a second nylon bag inside a sealed nylon bag, hands should be washed frequently).

11. The patient should avoid sharing personal items with household members and should not use glass, dishes and plates, towels, etc. of household members, and if necessary, such items should be washed thoroughly with water and soap. Textile products, towels, bedlinen beddings used by the patient should be washed with detergent at 60-90°C.

12. The patient room should be cleaned with gloves and masks. All surfaces that may have possibly been contaminated with respiratory secretions or body excretions should be cleaned with diluted bleach with 1:100 normal dilution (sodium hypochlorite Cas No: 7681-52-9), and in case of apparent contaminations, 1:10 normal dilution should be used. [Bleach preparation rates (of 10%): Preparation of 1/10 bleach: 1-unit bleach + 9-unit water (reveals 5000-6000 ppm chlorine) Preparation of 1/100 bleach: 1-unit bleach + 99 units water (reveals 500-600 ppm chlorine). Add 1 small teacup of bleach into 10 liters of water to practically produce 1/100 bleach.]

13. All household members should be responsible for monitoring their own medical conditions and should immediately refer to a health institution upon the emergence of any symptoms.

14. In case of any deterioration in the general conditions of the patient, 112 should be called to seek medical assistance and the health institution should be informed about the condition of the patient.

15. If the patient transfer is necessary, medical masks must be worn during transfer.
9. CONTACT FOLLOW-UP

Contacts with Probable/Confirmed case (close contact) should be monitored for 14 days. Health care workers should be monitored according to the algorithm on “Evaluation of Healthcare Workers with Contact”.

Follow-up for those who have been in close contact with the cases in the verification process for COVID-19 infection should end if the sample result is negative and follow-up should continue until day 14 if the test result is positive.

1. Contacts monitored at home should be followed by the Provincial Health Directorate by phone.
2. Contact should be at home during the follow-up period.
3. If the contact shares the same environment (home, street, hospital, etc.) with other individual(s), contact should wear a medical mask.
4. Follow-up patients should stay in a different room away from other household members or, if that is not possible, maintain a distance of at least 1 meter from each other and should wear a medical mask, and the mask should be replaced once dampened.
5. No visitors should be allowed into the home.
6. The movements of the patient in the house should be limited and shared spaces such as toilets, and bathrooms should be well ventilated.
7. The patient should avoid sharing personal items with others and should not use glass, dishes and plates, towels, etc. of household members and, if necessary, such items should be washed thoroughly with water and soap. Textile products, towels, bedlinen beddings used by the patient should be washed with detergent at 60-90°C.
8. Bathrooms and toilets should be cleaned with diluted bleach (1:100 normal dilution) (sodium hypochlorite Cas No: 7681-52-9) at least once a day.

All surfaces that may be contaminated with respiratory secretions or body excretions should be cleaned with diluted bleach (1:100 normal dilution) (sodium hypochlorite Cas No: 7681-52-9) and in case of apparent contaminations (1:10 normal dilution) should be used.

Bathrooms and toilets should be cleaned with diluted bleach (1:100 normal dilution) (sodium hypochlorite Cas No: 7681-52-9) at least once a day.
Bleach preparation rates (of 10%):

Preparation of 1/10 bleach: 1-unit bleach + 9-unit water (reveals 5000-6000 ppm chlorine)

Preparation of 1/100 bleach: 1-unit bleach + 99 units water (reveals 500-600 ppm chlorine)

Add 1 small teacup of bleach into 10 liters of water to practically produce 1/100 bleach
A fully equipped (gown, medical mask, face protector, or goggles) healthcare worker should apply triage in accordance with the case algorithm for COVID-19.

- **Do you have fever or history of fever?**
  - Yes
  - No
- **Do you have a cough?**
  - Yes
  - No
- **Do you have difficulties in breathing or respiratory problems?**
  - Yes
  - No

If any of the answers to the questions above is **YES**, PATIENT SHOULD BE EQUIPPED WITH A MASK and referred to the section allocated to COVID-19.

If answer to all the questions above is **NO**, patient should also be asked the following questions:

- **Have you been abroad within the last 14 days?**
  - Yes
  - No
- **Have any of your household members come from abroad within the last 14 days?**
  - Yes
  - No
- **Has any of your relatives been hospitalized due to respiratory tract disease within the last 14 days?**
  - Yes
  - No
- **Has any of your relatives been diagnosed COVID-19 within the last 14 days?**
  - Yes
  - No

If any of the answers to the questions above is **YES**, PATIENT SHOULD BE EQUIPPED WITH A MASK and referred to the section allocated to COVID-19 because of COVID-19 risk.

If answer to all questions above is **NO**, the case is considered as low-risk for COVID-19 and referred to relevant section for the complaint.
11. MANAGEMENT OF ADULT PATIENTS AT SPECIFIED COVID-19 OUTPATIENT CLINIC

Patients coming from triage/referral sections with wearing masks are subjected to evaluation for the case definition of COVID-19 at specified COVID-19 outpatient clinics.

Within the scope of such evaluation;

» Those who answer to the case definition of COVID-19 are taken into the designated area.

» Healthcare workers wear appropriate personal protective equipment (apron, medical mask, goggles/face protector, glove) to approach the patient.

» Anamnesis of the patient is taken,

» Patient is examined:

» Patient’s vital findings are checked (heart rate, rhythm, respiratory rate, blood pressure, body temperature and if possible, oxygen saturation is checked),

» Patient with unstable general conditions is provided with ventilatory support, circulatory support and admitted to the relevant department,

» Patient with stable conditions is examined.

» Examinations are ordered;

» Blood examinations: complete blood count, urea, creatinine, sodium, potassium, chlorine, AST, ALT, total bilirubin, LDH, CPK, D-dimer, ferritin, troponin, C-reactive protein values are demanded.

» Imaging: chest x-ray is taken and evaluated; suitable technique chest CT is taken in the following cases.

» Decisions for pregnant patients not suitable for CT are made according to their histories and examination findings.

» Chest CT:

» Fever +, cough — and Lung x-ray natural: unenhanced low dose CT

» Fever +, cough— and Lung x-ray diagnostic/non-diagnostic: Unenhanced low dose CT

» Fever+, cough +, comorbid disease or advanced age (50 and above) + and nondiagnostic lung x-ray: Unenhanced full-dose CT, in case of any indications due to any other disease, contrast-enhanced CT is taken.

⚠ Avoid CT on young women under the age of 20.
CT device should be duly cleaned after each patient to prevent cross-contamination.

As explained above, after the first evaluation;

11.1.  Management of an uncomplicated patient

a. Findings including fever, muscle/joint pains, cough, sore throat and nasal congestions excluding respiratory distress, tachypnea and SPO2 < 93%;

b. No underlying comorbid (mainly cardiovascular diseases, DM, HT, cancer, chronic lung diseases, and other immunosuppressive conditions) diseases and under the age of 50 years;

c. No bad prognostic measures in blood examinations (blood lymphocyte count <800/µl or CRP>40 mg/l or ferritin >500ng/ml or D-Dimer >1000 ng/ml, etc.); and

d. Normal lung x-ray and/or chest CT.

are evaluated as an uncomplicated setting of disease and;

» Healthcare workers should wear recommended personal protective equipment (apron, N95 mask, goggles/face protector, gloves) to be protected against COVID-19 infection while sampling respiratory tract specimens to take a sample from the respiratory tract for PCR test.

» The probable case is dispatched to home or related isolation places with the suggestion of isolation outside the hospital (related isolation place is specified by the Provincial/District Directorate of Health, if necessary) by initiating the empirical therapy.

» Hydroxychloroquine sulfate should be preferred for empirical therapy

» Considering seasonal and other factors, oseltamivir may be integrated into the therapy for cases that do not exclude influenza

» Medication should be delivered by the hospital pharmacy

» No antibiotic therapy is recommended to this group of patients, with no findings to support pneumonia upon examination and imaging and mild clinical manifestations.

» Healthcare teams appointed to outpatient monitoring should call such patients on a daily basis to inquire about their symptoms and clinical conditions. In-place evaluation should be conducted in necessary or suspicious cases.

» The patient is monitored outside the hospital by being informed about coming to the hospital by wearing a mask if one’s general conditions and symptoms deteriorate.
Those with positive test results

- those with improving symptoms and findings should complete the suggested duration of therapy and be isolated at home until day 14 following the recovery of symptoms.
- those with ongoing symptoms and findings or deteriorating clinical conditions should be hospitalized, and the decision either to continue monitoring at home or to hospitalize should be based on clinical conditions.

Those with negative test results

- those with improving symptoms and findings should be isolated at home until day 14 following the recovery of symptoms;
- those with ongoing symptoms and findings, who run a fever, suffer an increase in coughing or develop dyspnea should wear a mask and be admitted to hospital for further evaluation on second sampling, hospitalization, or other probable reasons.

**NOTE:** Outpatient monitoring decision (at home or relevant isolation places) should be based upon the clinical manifestations of the patient and the need for supportive therapy, the patient’s ability to self-isolate at home, and whether patients and their relatives are capable of cooperating. Otherwise, such patients must be monitored at the hospital.

### 11.2. Management of pneumonia/severe pneumonia patients

#### 11.2.1. Pneumonia symptoms

- Findings including fever, muscle/joint pains, cough, sore throat and nasal congestion with respiratory rate <30/minute, SpO2 level 90% at room air;

- No underlying comorbid (mainly cardiovascular diseases, DM, HT, cancer, chronic lung diseases, and other immunosuppressive conditions) diseases and under the age of 50 years;

- No bad prognostic measures in blood examinations upon admission (blood lymphocyte count <800/µl or CRP>40 mg/l or ferritin >500ng/ml or D-Dimer >1000 ng/ml, etc.); and
d. Mild pneumonia findings in lung x-ray or chest CT. Are considered as a mild form of pneumonia (with no severe finding of pneumonia) and

» Healthcare workers should wear recommended personal protective equipment (apron, N95 mask, goggles/face protector, gloves) to protect against COVID-19 infection while sampling respiratory tract specimens to take a sample from the respiratory tract for PCR test.

» The probable case is dispatched to home or related isolation places with the suggestion of isolation outside the hospital (related isolation place is specified by the Provincial/District Directorate of Health, if necessary) by initiating the empirical therapy.

» Hydroxychloroquine sulfate should be preferred for empirical therapy

» Considering seasonal and other factors, oseltamivir may be integrated into the therapy for cases that do not exclude influenza

» Medication should be delivered by the hospital pharmacy

» Healthcare teams appointed to outpatient monitoring should call such patients daily to inquire about their symptoms and clinical conditions. In-place evaluation should be conducted in necessary or suspicious cases.

» The patient is monitored outside the hospital by being informed about coming to the hospital by wearing a mask if one’s general conditions and symptoms deteriorate.

» Those with positive test results

» those with improving symptoms and findings should complete the suggested duration of therapy and isolated at home until day 14 following the improvement of symptoms.

» those with ongoing symptoms and findings or deteriorating clinical conditions should be hospitalized, and the decision either to continue monitoring at home or to hospitalize should be based on clinical conditions.

» Those with negative test results

» those with improving symptoms and findings should be isolated at home until day 14 following the improvement of symptoms;

» those with ongoing symptoms and findings, who run a fever, suffer an increase in coughing or develop dyspnea should wear a mask and be admitted to hospital for further evaluation on second sampling, hospitalization, or other probable reasons.
NOTE: Outpatient monitoring decision (at home or relevant isolation places) should be based upon the clinical manifestations of the patient and the need for supportive therapy, the patient’s ability to self-isolate at home, and whether patients and their relatives are capable of cooperating. Otherwise, such patients must be monitored at the hospital.

11.2.2. **Severe pneumonia findings**

a. Those with fever, muscle/joint pains, cough, sore throat, and nasal congestion, tachypnea (≥30/minutes), and SpO2 level under % 90 at room air;

b. Bad prognostic measures in blood examinations upon admission (blood lymphocyte count <800/µl or CRP>40 mg/l or ferritin >500ng/ml or D-Dimer >1000 ng/ml, etc.); and

c. Bilateral diffused pneumonia finding in lung x-ray or CT

Intensive care consultation should be requested for evaluation of hospitalization into the intensive care unit according to the following criteria. *Decision to put patients into intensive care is taken together with the intensive care physician.

* Healthcare workers should wear recommended personal protective equipment (apron, N95 mask, goggles/face protector, gloves) to protect against COVID-19 infection while sampling respiratory tract specimens to take a sample from the respiratory tract for PCR test.

* Patient is isolated in accordance with the requirements for contact and droplet isolation.

* Empirical therapy should start in accordance with the therapy algorithm before test results are received.

  » Hydroxychloroquine sulfate and/or favipiravir should be preferred for empirical therapy

  » Azithromycin should be initiated (should be evaluated as to contraindications)

* Considering seasonal and other factors, oseltamivir may be integrated into the therapy for cases that do not exclude influenza. Cases administered or added favipiravir should not be administered oseltamivir or oseltamivir should be discontinued.
Antibiotic therapy may be initiated on these patients due to available findings that support pneumonia through imaging methods.

Those with positive test results

- those with improving symptoms and findings should complete the suggested duration of therapy and isolated at home until day 14 following the recovery of symptoms.
- those with ongoing symptoms and findings or deteriorating clinical conditions should be evaluated with the suggestion of intensive care therapy as to other options of treatment according to their clinical manifestations.

Those with negative test results

- PCR sampling should be retaken after 24 hours;
  - Those with second PCR (-) should be evaluated as to alternative diagnoses.
  - Those with second PCR (+) should continue COVID-19 treatment.

11.3. Patients to be considered to need Intensive Care

- Dyspnea and respiratory distress
- Respiratory rate >30/minutes
- PaO2/FiO2 <300
- Increasing need for oxygen on follow-up
- SPO2<90 and PaO2<70 despite 5 L/min. oxygen therapy
- Hypotension (systolic blood pressure <90 mmHg and more than 40 mmHg drop than SBP and average artery pressure <65 mmHg, tachycardia >100/min.
- Acute organ dysfunction development such as acute renal damage, a disorder in acute liver function tests, confusion, acute hemorrhage diathesis, and immunosuppression
- Increase in troponin level and arrhythmia
- lactate >2 mmol
- Availability of capillary refill disorder and skin disorders such as cutis marmaratus

It is recommended to consult the intensive care to evaluate the patients with the above criteria. Decision to put patients into intensive care is taken together with the intensive care physician.
12. USE OF THORACIC COMPUTERIZED TOMOGRAPHY ON COVID-19 PATIENTS

COVID-19 case management algorithm specifies clearly when to apply thoracic CT on probable/confirmed COVID-19 cases. Thoracic CT is used to confirm the diagnosis, to demonstrate pulmonary involvement, or to evaluate the prevalence of infection across the lung in probable/confirmed COVID-19 cases.

12.1. Infection Control for COVID-19 in Radiology Units

Being in the same environment at a distance closer than 1 meter with a COVID-19 patient without any personal protective equipment for longer than 15 minutes is considered as close contact with COVID-19 as it infects through droplets. The disease may also transmit through contact with surfaces that have been contaminated while the patient was speaking, coughing, and sneezing.

Therefore, the following droplet and contact measures must be taken in radiologic diagnosis units:

1. Probable or confirmed COVID-19 patients and healthcare workers must wear medical masks.

2. Personal protective equipment (gloves, gown, medical mask, goggles/face protector) must be kept available for the healthcare worker.

3. Healthcare workers should deal with the patient from at least 1 meter and if it is necessary to get closer than 1 meter, one should wear a medical mask and gloves, apron, and goggles/face protector.

4. The proper use of gloves and hand hygiene before and after the use is of great importance. Healthcare workers should not touch the perimeters of the patient with unreplaced gloves to avoid the risk of contamination.

5. Hands must be washed with water and soap for at last 20 seconds to ensure hygiene or rubbed with hand antiseptics containing alcohol for 20-30 seconds.

6. The room must be cleaned and disinfected after the patient leaves the room. Cleaning must primarily focus on touched surfaces. Surfaces can be disinfected with a disinfectant preferred for hospital disinfection after cleaning with water and detergent. 1/100 diluted bleach (Sodium hypochlorite Cas No: 7681-52-9) or chlorine tablet (as per product suggestion) may be used. Chlorine compounds may corrode surfaces and thus, are recommended for durable surfaces.
1/10 diluted bleach (Sodium hypochlorite Cas No: 7681-52-9) or chlorine tablet (as per product suggestion) may be used on surfaces contaminated with patient excretions. 70% alcohol may also be used for disinfecting surfaces.

7. Cleaning personnel must wear personal medical masks, gowns, gloves, and goggles.

8. Patient wastes must be disposed of into medical waste boxes.

9. New patients may only be allowed in after the cleaning and disinfection are completed.
13. TREATMENT OF COVID-19 ADULT PATIENTS

Patients under the age of 50, who apply with a mild clinic manifestation and with no underlying diseases, may not be hospitalized for monitoring and may be monitored at home. The decision to monitor at the hospital or home is made by the physician in charge of the case.

The decision to monitor at home or the hospital should be based on the clinical manifestations of the patient and the need for supportive therapy, availability of risk factors for the development of severe manifestations of the disease, patient’s ability to self-isolate at home and whether patients and their relatives are capable of cooperating.

It should be acknowledged that the risk of developing a severe disease is higher in the second week of disease, and home-care patients should be duly informed to apply to the hospital in case they develop dyspnea or persistent fever. Patients to be monitored at home should be selected according to the algorithm on “Monitoring Patients at Home”.

The following patients have a higher risk of complication and severity of the disease, and therefore, it is suggested to hospitalize for monitoring such patients who:

» are older than 50 years;
» have underlying diseases (cardiovascular disease, DM, HT, cancer, chronic lung diseases, and other immunosuppressive cases),
» have severe pneumonia measures (confusion or tachycardia (>125/min.) or
» have respiratory distress or tachypnea (>30/min) or hypotension <90/60 mmHg or SpO2 <92% or bilateral diffused involvement in lung imaging),
» have sepsis, septic shock,
» have cardiomyopathies, arrhythmia or
devlop acute renal damage or
» show bad prognostic measures in blood analyses upon admission (blood lymphocyte count <800/µl or serum CRP>40 mg/l or ferritin >500ng/ml or D-Dimer >1000 ng/ml, etc.)

If bacterial or influenza pneumonia cannot be excluded from pneumonia diagnosed COVID-19 cases, empirical treatment should include such factors. Antibiotic to be used in empirical treatment should be planned according to the clinic conditions of the patient (community-acquired pneumonia, healthcare-related pneumonia, sepsis, comorbidities,
immunosuppression, application for healthcare in the last 3 months, previous use of antibiotics) and local epidemiologic data and therapy guides. If antibiotic treatment is to be administered, it should be planned to include atypical pneumonia (beta-lactam antibiotics + macrolide or respiratory quinolone).

13.1. **Treatment for SARS-CoV-2 in COVID-19 Patients**

No reliability and effectiveness-proven treatment are yet available for COVID-19. More than 100 randomized controls are conducted recently with numerous medications to find the most effective treatment of this disease, and results are expected to be announced in the upcoming months.

It is known that the use of treatment options within the framework of randomized controlled studies and based on the data obtained through other scientific research is more rational. Nevertheless, due to the urgency of current conditions and the limited number of scientific data, treatment options with data of probable effectiveness, even if limited, are used widely for such patients throughout the world. Like in viral infections in general, data obtained from SARS and influenza suggest that it is more useful to initiate antiviral treatment in the early stages. Therefore, it is suggested to immediately start hydroxychloroquine treatment on symptomatic patients with a probability of COVID-19. The combined use of possible therapy options in COVID-19 patients should be explicitly considered for the patient and by evaluating interactions of drugs used and their adverse effects. Hydroxychloroquine may extend the QT range and cause a tendency to ventricular tachycardia. This risk is higher in particular in elderly patients with cardiac comorbidity, who are on another drug that extends QT and manifest electrolyte disorders. Therefore, risk assessment and if necessary cardiologic consultation should be conducted before deciding to initiate hydroxychloroquine to any patient or to check QT extension if already on hydroxychloroquine due to COVID-19.

The recommendations suggested here on the treatment of COVID-19 have been compiled in accordance with the evaluations on all available evidence and ongoing clinical study protocols and line with the views of relevant experts in the absence of evidence. These recommendations will be updated according to the results of studies to be published concerning the treatment of COVID-19.

Suggested therapies for Probable/Confirmed COVID-19 patients are provided in Tables 1 and 2. Alternate agents such as lopinavir/ritonavir may be taken into consideration in specific to patients who cannot be administered such drugs due to various reasons, with the support of relevant literature.
Table 1. Suggested Therapies for Outpatient Asymptomatic Confirmed COVID-19* Cases and Uncomplicated** or Mild Pneumonia*** Probable/Confirmed COVID-19 Cases

<table>
<thead>
<tr>
<th>Name of Drug</th>
<th>Daily Dose, Administration Method</th>
<th>Duration of Therapy (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydroxychloroquine****</td>
<td>2x200 mg tablet, oral</td>
<td>5</td>
</tr>
</tbody>
</table>

**NOTE:** Oseltamivir should be given to cases with clinic manifestations complying with influenza, or where influenzas cannot be excluded due to season and other factors or those testing positive for a diagnosis of influenza. Oseltamivir is not recommended for the treatment of COVID-19.

*Current scientific data fails to potently support the administration of hydroxychloroquine to individuals with COVID-19 PCR test positive and who are asymptomatic. However, based upon the general information that drugs initiated at early stages are more effective, hydroxychloroquine may be started on those patients subject to the approval of the patient’s physician and provided to be careful about side effects.

** a. Findings including fever, muscle/joint pains, cough, sore throat and nasal congestions excluding respiratory distress, tachypnea and SPO2 < 93%;
 b. No underlying comorbid (mainly cardiovascular diseases, DM, HT, cancer, chronic lung diseases, and other immunosuppressive conditions) diseases and under the age of 50 years;
 c. No bad prognostic measures in blood examinations upon admission (blood lymphocyte count <800/µl or CRP>40 mg/l or ferritin >500ng/ml or D-Dimer >1000 ng/ml, etc.); and
 d. Normal lung x-ray and/or chest CT.

*** a. Findings including fever, muscle/joint pains, cough, sore throat and nasal congestions, respiratory rate <22/minute, SPO2 level more than 93% in room air;
 b. No underlying comorbid (mainly cardiovascular diseases, DM, HT, cancer, chronic lung diseases, and other immunosuppressive conditions) diseases and under the age of 50 years;
 c. No bad prognostic measures in blood examinations upon admission (blood lymphocyte count <800/µl or CRP>40 mg/l or ferritin >500ng/ml or D-Dimer >1000 ng/ml, etc.); and
 d. Mild pneumonia finding in lung x-ray and chest CT.

**** Hydroxychloroquine may extend the QT range and cause a tendency to ventricular tachycardia. This risk is higher in particular in elderly patients with cardiac comorbidity, who are on another drug that extends QT and manifest electrolyte disorders. Therefore, risk assessment and if necessary cardiologic consultation should be conducted before deciding to initiate hydroxychloroquine to any patient or to check QT extension if already on hydroxychloroquine due to COVID-19. (for further details, please visit https://www.acc.org/latest-in-cardiology/articles/2020/03/27/14/00/ventricular-arrhythmia-risk-due-to-hydroxychloroquine-azithromycin-treatment-for-covid-19)
<table>
<thead>
<tr>
<th>Name of Drug</th>
<th>Daily Dose, Administration Method</th>
<th>Duration of Therapy (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treatment in Uncomplicated * Probable/Confirmed COVID-19 Cases</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydroxychloroquine (^1) 200 mg tablet</td>
<td>2x200 mg tablet, oral</td>
<td>5 days</td>
</tr>
<tr>
<td>-/+ Azithromycin(^2)</td>
<td>First Day 500 mg tablet, oral</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Following 4 days 250 mg/day</td>
<td></td>
</tr>
<tr>
<td><strong>Treatment in Probable/Confirmed COVID-19 Cases with Mild Form of Pneumonia</strong> (with No Finding of Severe Pneumonia)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydroxychloroquine (^1) 200 mg tablet</td>
<td>Following a loading dose of 2x400 mg 2x200 mg tablet, oral</td>
<td>5 days</td>
</tr>
<tr>
<td>-/+ Azithromycin(^2)</td>
<td>The first day 500 mg tablet, oral</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Following 4 days 250 mg days</td>
<td></td>
</tr>
<tr>
<td>**Treatment in Probable/Confirmed COVID-19 Cases with Severe Pneumonia **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydroxychloroquine (^1) 200 mg tablet</td>
<td>Following a loading dose of 2x400 mg, 2x200 mg tablet, oral</td>
<td>5 days</td>
</tr>
<tr>
<td>AND/OR Favipiravir (^3) 200 mg tablet</td>
<td>2 x 1600 mg loading, 2 x 600 mg maintenance</td>
<td>5 days</td>
</tr>
<tr>
<td>-/+ Azithromycin(^2)</td>
<td>First Day 500 mg tablet, oral</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Following 4 days 250 mg/day</td>
<td></td>
</tr>
<tr>
<td><strong>Treatment in cases with progressing pneumonia findings or clinical manifestations becoming severe</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Favipiravir (^3) 200 mg tablet</td>
<td>2 x 1600 mg loading, 2 x 600 mg maintenance</td>
<td>5 days</td>
</tr>
</tbody>
</table>

\(^1\) Depending on body weight. If the weight exceeds 90 kg, the dose should be increased.

\(^2\) Start treatment on the first day, then 500 mg once daily.

\(^3\) Favourable for patients not responding to hydroxychloroquine.
**Treatment in pregnant patients with a confirmed diagnosis of COVID-19 ****

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Dosage Details</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydroxychloroquine 1 200 mg tablet</td>
<td>2x200 mg tablet, oral</td>
<td>5 days</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lopinavir 200 mg/ritonavir 50mg tablet</td>
<td>2x2 tablet, oral</td>
<td>10-14 days</td>
</tr>
</tbody>
</table>

**Please refer to the relevant section for the diagnosis and treatment of patients considered to have developed MAS during service follow-up.**

**NOTE:** Oseltamivir should be given to cases with clinic manifestations that fit influenza, or where influenzas cannot be excluded due to season and other factors or those testing positive for a diagnosis of influenza. Oseltamivir is not recommended for the treatment of COVID-19.

* a. Findings including fever, muscle/joint pains, cough, sore throat and nasal congestions excluding respiratory distress, tachypnea and SPO2 < 90%;

b. Normal lung x-ray and/or chest CT.

** a. Findings including fever, muscle/joint pains, cough, sore throat and nasal congestions with respiratory rate <30/minute and SPO2 level more than 90% in room air;

b. A mild finding of pneumonia in lung x-ray or chest CT.

*** patient with tachypnea (≥30/mn) and SPO2 level under 90% in room air and bilateral diffused pneumonia finding in lung x-ray or chest CT.

**** It has been reported that pregnancy does not pose any additional risks for a severe form of COVID-19. Untreated monitoring options should be considered primarily for uncomplicated COVID-19 infection in pregnant patients. Treatment should be considered in case of any risk factors in pregnant diagnosed probable or in case of severe form.

1 Hydroxychloroquine may extend the QT range and cause a tendency to ventricular tachycardia. This risk is higher in particular in elderly patients with cardiac comorbidity, who are on another drug that extends QT and manifest electrolyte disorders. Therefore, risk assessment and if necessary cardiologic consultation should be conducted before deciding to initiate hydroxychloroquine to any patient or to check QT extension if already on hydroxychloroquine due to COVID-19. (for further details please visit https://www.acc.org/latest-in-cardiology/articles/2020/03/27/14/00/ventricular-arrhythmia-risk-due-to- hydroxychloroquine-azithromycin-treatment-for-covid-19). The duration of hydroxychloroquine therapy may be extended up to 7-10 days in patients who have persistent fever and hypoxia by the end of day 5 despite clinical responds.

2 May not be initiated by the decision of relevant physician or underlying risk factors of the patient. Both azithromycin and hydroxychloroquine may extend the QT range and cause a tendency to ventricular tachycardia. Inclusion of azithromycin should be considered upon the decision of relevant physician in the light of the above information. This risk is higher in particular in elderly patients with cardiac comorbidity, who are on another drug that extends QT and manifest electrolyte disorders. Therefore, risk assessment and if necessary cardiologic consultation should be conducted before deciding to initiate hydroxychloroquine±azithromycin to any patient or to check QT extension if already on hydroxychloroquine ±azithromycin due to COVID-19 (for further details, please visit https://www.acc.org/)
Supplementary Treatment in COVID-19 Patients

Corticosteroid treatment is recommended with a poor level of evidence at 1-2 mg/kg/day, methylprednisolone for 5-7 days in ARDS cases solely with mechanic ventilation in the Sepsis Guidelines by European Society of Intensive Care adopted to COVID-19 published on 20.03.2020 and is not recommended in pneumonia with no ARDS.

“Immune Plasma may be applied subject to permission of relevant boards of the Ministry of Health in ARDS cases with COVID-19 positive clinic symptoms and bilateral infiltration manifested on tomography.”

“Alternative treatments such as stem cell may be tried subject to permission of relevant bodies of the Ministry of Health on COVID-19 patients.”.

General Approach to Probable/Confirmed COVID-19 Infection

1. The patient should be equipped with a medical mask and taken in a separate place at least 1 meter away from other patients.

2. If possible, the patient should be taken into a single room with a bathroom and toilet, and droplet isolation measures should be taken.

3. Fundamental personal protective measures should be taken for those individuals in contact with the patient (attendant and relatives). The room should be regularly ventilated and cleaned.

4. Vital findings of the patient (heart rate, rhythm, respiratory rate, blood pressure, body temperature, oxygen saturation) should be regularly monitored.

5. Complete blood count, lymphocyte count, C-reactive protein, procalcitonin, liver and lung parameters, cardiac enzymes, LDH, coagulation parameters, fibrinogen, D-dimer, ferritin, arterial blood gases, and lung x-ray should be demanded and results should be evaluated. Blood cultures should be taken prior to antibiotic treatment.

6. Conservative fluid treatment should be initiated on patients with no shock status. A routinely maintained saline solution is not required. It must be remembered that fluid treatment applied in an uncontrolled manner may compromise oxygenation.

7. A surgical mask may be applied to nasal oxygen canula to reduce the risk of infection through droplets in hypoxemic patients.
8. Patients with a severe respiratory infection, ARDS, hypoxemia, or shock status may be initiated with oxygen therapy with 5L/min nasal or standard face mask. Target oxygen saturation should be titred as > 90% (92-95% for the pregnant).

9. In cases where higher oxygen fraction is needed, non-breather masks may be used with added exhalation filters that do not allow rebreathing, if accessible.

10. Patients, who are considered to have sepsis according to laboratory and clinical evaluations, should start appropriate antimicrobial treatment within one hour after admission to the hospital. Antibiotic therapy should be selected according to the clinic conditions of the patient (community-acquired pneumonia, healthcare-related pneumonia, sepsis, comorbidities, immunosuppression, application for healthcare in the last 3 months, previous use of antibiotics) and local epidemiologic data and therapy guidelines. Antibiotic treatment should be planned to include atypical pneumonia in severe pneumonia. Neuraminidase inhibitors may also be added for influenza according to risk factors and clinic status for influenza.

11. Samples should be taken from both upper airways (nasopharyngeal and oropharyngeal swab) and lower airways (phlegm, endotracheal aspirate) and if possible, respiratory bacterial and viral panels should be operated. Bronchoscopy should be avoided solely for sampling purposes.

12. Patients may manifest rapid clinic deterioration, and therefore, they must be closely monitored for progressive respiratory failure and sepsis.

13. Patients should be evaluated in terms of comorbid diseases, and their treatments related to such diseases should also be regulated.

14. Routine steroid treatment is not recommended but should be applied in accordance with any accompanying comorbidity diseases and other reasons (chronic obstructive lung disease, refractory septic shock, etc.).

15. Inhaler drugs to be implemented through nebulization should be applied if possible, through metered dose inhalers considering the risk of contamination.

13.2.2. Management of Patient with Severe Pneumonia

Symptoms of COVID-19 infection might be of mild, moderate, and severe form. Severe disease may manifest itself in forms of severe respiratory infection (severe pneumonia), Acute Respiratory Distress Syndrome (ARDS), sepsis, septic shock, myocarditis, arrhythmia and cardiogenic shock, and multiple organ failure. Respiratory failure is frequently displayed as hypoxemic respiratory failure and less frequently as hypercapnic respiratory failure. Furthermore, decompensated heart failure and chronic lung diseases
inflammations may also accompany these patients. Such patients should be monitored under intensive care:

Severe disease developing cases are more common in males (male/female: 2:1). While hypertension and diabetes mellitus are the most frequent type of comorbid diseases, advanced age is also another risk for the development of severe disease.

**Severe respiratory tract infection (pneumonia):** If patients with fever and respiratory infection symptoms have;

- respiratory rate> 30/min

and/or

- Severe respiratory distress (dyspnea, use of extra respiratory muscles)

and/or

- Oxygen saturation in room air < 90% (patient receiving oxygen PaO2/FiO2 < 300), a thoracic CT should be planned.

Chest CT findings of COVID-19 pneumonia are likely to have a peripheral distribution of bilateral lobular mode with ground-glass opacities.

CT findings in a series of 21 inpatient cases who have developed COVID-19 pneumonia were classified under four stages by their radiological prognosis:

1. **Early period (days 0-4 days):** ground-glass opacities, lower lobe, and frequently bilateral involvement
2. **Progression period (days 5-8):** Rapid progression, bilateral multi-lobular ground-glass opacities
3. **Peak time (days 9-13):** more common consolidations with low progression in involvement zones
4. **Resolution period (after day 14):** regression of radiological densities up to 26 days upon controlling the infection.

**13.2.3. Acute Respiratory Distress Syndrome (ARDS)**

- Respiratory distress occurring or deteriorating in the last week
- Pleural effusion, collapse or nodular bilateral opacities in radiological terms
- Respiratory failure that cannot be explained with heart failure or excess volume
» Mild ARDS: 200 < PaO2/FiO2 ≤ 300 (PEEP ≥ 5 cmH2O)
» Moderate ARDS: 100 < PaO2/FiO2 ≤ 200 (PEEP ≥ 5 cmH2O)
» Severe ARDS: PaO2/FiO2 ≤ 100 (PEEP ≥ 5 cmH2O)

13.2.4.  **Sepsis**
Symptoms of organ failure coexisting with a suspicious or proven infection (changes in consciousness, respiratory distress, low oxygen saturation, decreased urination, increased creatinine, increased heart rate, weak pulse, cold extremities or low blood pressure, symptoms of coagulopathy, thrombocytopenia, increased level of lactate or hyperbilirubinemia)

13.2.5.  **Septic Shock**
Hypotension resistant to fluid therapy, need for a vasopressor to keep average arterial pressure at ≥ 65 mmHg and lactate level of > 2 mmol/L

Please remember that patients may develop myocarditis and associated cardiogenic shock.

13.2.6.  **Approaches and methods applicable in case of severe respiratory infection, hypoxemic respiratory failure, or ARDS:**

1. Severe COVID-19 infection commences with flu-like symptoms at the beginning and progresses with hypoxemic respiratory failure by days 7-10. According to the expert opinions on patient monitoring, compliance was protected in around 2/3 of patients and the disease does not progress like conventional ARDS with only 1/3 progressing like conventional ARDS with low compliance.

2. Therefore, oxygen therapy may suffice for most of the patients under close monitoring. Oxygen therapy may be applied in conventional low flow (< 15 L/min) methods or through high flow nasal canulas. The targeted oxygen saturation is > 92%. At most, 6L of oxygen can be provided per minute with a nasal cannula and achieved FiO2 may not exceed 45%. Therefore, the oxygen for the patients who need oxygen more than 6 L/minute, should be applied using a basic face mask and non-breather (valve) bag masks. 5 L/minute oxygen should be started with a simple face mask and continue up to 8 L/min at most. Achieved FiO2 is 60% at most. Non-breather (valve) bag masks can obtain >85% FiO2 at a flow rate of 10-15 L/min. However, it must be remembered that applying > 6 hours FiO2 > 60% may also cause oxygen toxicity itself. In cases where it is impossible to regulate oxygenation through these methods, oxygen should be applied to ensure that FiO2 is <60% by increasing the flow (at most 60 L/min) through high flow nasal cannula system. In particular, due to aerosolization risk of applying high flow oxygen, it should be applied in negative pressure rooms, if possible, and if not, in single rooms with maximum PPE.
3. Patients under oxygen therapy should be monitored for SO2 as well as respiratory rate, dyspnea, use of extra respiratory muscles, respiration depth, and, if necessary, for arterial blood gas. In cases where respiratory workload increases (dyspnea, tachypnea (≥30/min.), use of extra respiratory muscles, paradoxical respiration, respiratory alkalosis (PaCO2<35 mmHg, pH>7.45)) mechanic ventilation should be considered with intubation.

4. If the patient is not in need of immediate intubation, noninvasive mechanic ventilation (NIMV) may be tried. Patients should be monitored closely as to clinical deterioration. If no positive response is received within the first few hours (refractory hypoxemia, tachypnea, tidal volume >9 ml/ideal kg), the patient should be evaluated in terms of invasive mechanic ventilation. NIMV may be applied through oro-nasal, full-face, and helmet mask and should be implemented with intensive care ventilators or dual circuit ventilators; viral/bacterial filters should be equipped to inspiration and expiration outlets of circuits. NIMV should be avoided in patients with uncontrollable secretions, risk of aspiration, hemodynamic distress, multiorgan failure, or mentally impaired patients. Due to the risk of aerosolization, NIMV must be applied in negative pressure rooms, if possible, or if not, in single rooms with maximum PPE.

5. Prone position on non-intubated patients with lung involvement has shown positive effects on hypoxia. Patients should be positioned in prone for a long time during the day, even if they are not intubated. The prone position should be applied for more than 12 hours a day if no contraindication is available in severe ARDS cases under mechanic ventilation (PaO2/FiO2<150).

6. Hyperpyrexia must be quickly controlled to prevent endothelium damage due to cytokine storm.

7. Hypercoagulability and fever and inflammation-induced hypovolemia may develop in most of the patients. Diuretics (furosemide) must be avoided unless hypervolemia occurs, and patients must be kept euvoletic. However, conservative fluid support must be given if no tissue hypoperfusion symptoms are available in conventional ARDS management under mechanic ventilation.
8. Endotracheal intubation must be performed by trained and experienced individuals based upon rapid sequence intubation protocol. Intubation should be implemented through a video laryngoscope, if possible. Patients who are considered to have challenging airways may be intubated with flexible bronchoscopy. However, bronchoscopy also poses a high risk of aerosolization. Intubation must be performed in negative pressure rooms due to the risk of aerosolization, if possible, and, if not possible, in single rooms with maximum PPE. The use of a bag-mask should be avoided during preoxygenation, if possible. A filter must be used in bag masks. Neuromuscular blockers may be used to suppress coughing prior to intubation. Positive pressure ventilation should not be initiated before inflating the endotracheal cuff. Heat and moisture exchanger (humidifier) filter may be used, but active humidification should be preferred in case of profound plug and increased dead space. Mechanic ventilator circuit must not be disconnected unless necessary, and if it is necessary, personal protective equipment must be used. If possible, a closed system aspiration method should be used. Bronchoscopic processes should be avoided unless necessary and metered dose inhaler should be preferred over nebulization in bronchodilator treatment.

9. Low tidal volumes (4-8 ml/ideal kg) and low inspiratory pressures (plateau pressure < 30 cmH2O; driving pressure (plateau pressure — PEEP) < 14 cmH2O) should be used for patients who develop ARDS clinical manifestations. In cases where pH < 7.15 and hypercapnia is available, tidal volumes may be increased up to 8 ml/kg and respiratory rate up to 30/min. Otherwise, permissive hypercapnia may be allowed if PaO2 is 60-85 mmHg, SO2 is 88-95%.

10. Sedation and a neuromuscular agent may be used within the first 24-48 hours, but excessive sedation should be avoided in general, or sedation should be mild. Although it is not recommended to routinely use neuromuscular blocker agents, they may be used in case of ventilator incompatibility, persistent hypoxemia or hypercapnia despite sedation in moderate-severe ARDS.

11. If compliance is at good levels (static > 40 mL/cmH2O) in intubated patients, recruitment and high PEEP values may not be required. However, patients with low compliance must be treated like conventional ARDS, and in particular, PEEP must be applied to ensure best compliance and oxygenation in a way to avoid hemodynamic disturbance in moderate-severe cases (PaO2/FiO2 < 200).

12. Inhale nitric oxide, or extracorporeal life support (ECMO) may be considered as a last resort for ARDS patients. Experienced centers should be contacted to transfer patients, if necessary, for ECMO.
Ideal weight in kg to calculate the tidal volume

Male \(50 + (0.91 \times [\text{height cm} - 152.4])\)

Female \(45.5 + (0.91 \times [\text{height cm} - 152.4])\)

Low PEEP

<table>
<thead>
<tr>
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<th>30</th>
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High PEEP

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<td>24</td>
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</table>

Approaches and methods applicable in case of septic shock

1. In sepsis bundles, it is suggested to apply 30 ml/kg isotonic crystalloid fluid (saline solution or ringer lactate) within the first hour; however fluid therapy must be carefully conducted to avoid hypervolemia in ARDS patients.

2. In case of shock status despite fluid resuscitation or very deep hypotension, vasopressor support must be immediately to ensure that average arterial pressure is 65 mmHg.

3. Lactate should be monitored.

4. Noradrenalin should be selected as the first option vasopressor agent.

5. The subsequent treatment should be specified based on cardiac output and fluid responsivity.

13.2.7. Suggestions on Tocilizumab and other anti-cytokine/anti-inflammatory therapies

No certain data is available to confirm that anti-cytokine therapies would prove useful in treating 53-year old ARDS and longstanding sepsis, and these drugs are not used in routine treatment. The only application that has proven to increase survival with randomized controlled studies in ARDS treatment is lung protective mechanic ventilation. In general, sepsis is considered an immunosuppressive case and in its course, patients are mostly lost due to nosocomial and opportunistic infections. Data is available to confirm that treatments such as monoclonal tocilizumab antibody with anti-IL6R effect may cause ARDS by themselves.
However, it is known that there might be differences in immune response in the course of sepsis developed in relation to different infections and macrophage activation syndrome (MAS) characterized with cytokine storm depending on hyperinflammatory respond or in other words, acquired (primary) hemophagocytic lymph histiocytosis (sHLH) symptoms may develop in certain patients. Subgroup studies on treatments in sepsis patients manifest that patients with accompanying MAS symptoms may benefit from anti-cytokine therapies.

It is observed that MAS may manifest itself, either sepsis and ARDS symptoms are available or not, during COVID-19 infection and that such patients may benefit from anti-cytokine therapies.

13.2.7.1. Identification of Macrophage Activation Syndrome

It is known that MAS may also develop in the course of COVID-19 disease; however, no data is available with a high level of evidence with regard to its frequency and definite treatment. It is considered that 10% of COVID-19 patients may be included in the critical picture and that MAS-induced cytokine storm may contribute to the development and deterioration of critical processes. Therefore, the group of patients to benefit from anti-cytokine treatments should be defined correctly and timely for the effective and safe planning of treatment. Even though case series and observations that have been reported until today show that MAS symptoms seen in COVID-19 patients show similarity in general to MAS pictures that are observed in genetic HLH or rheumatic diseases, it should be remembered that not all MAS/HLH symptoms may not develop based upon the course of the disease and not all scores and criteria used in diagnosing other diseases may prove useful. Therefore, cross-sectional evaluations based on one-time measurements should be avoided in diagnosing MAS, and any changes developing within hours or days in clinical and laboratory symptoms should be taken into consideration.

Availability of persistent fever, persistently high or increasing CRP and ferritin values, D-dimer height, cytopenia in forms of lymphopenia and thrombocytopenia, liver function test disruptions, hypofibrinogenemia or increase in triglyceride levels despite a treatment indicate coexisting MAS setting. Rather than determining a threshold for laboratory symptoms, CRP in consecutive measurements, ferritin, increase in D-dimer values and/or drops in lymphocyte, thrombocyte counts should be considered to catch any MAS symptoms. In addition, the unavailability of secondary infections must be proven with culture and normal procalcitonin values.
MAS is a complication that requires close monitoring and early treatment, and it may become more difficult or impossible to suppress cytokine storm that develops only within hours upon diagnosis if not treated. Rheumatology and/or hematology experts must be referred to if necessary, to confirm MAS diagnosis and diagnosed patients should start treatment as soon as possible.

13.2.7.2. Tocilizumab in Treatment of MAS

Although based on open trial data on a limited number of patients, it is reported that tocilizumab has positive effects on COVID-19-associated MAS manifestation. Effectiveness of both tocilizumab and other IL-6 blocking biological drugs and of IL-1 blocking in a severe form of COVID-19 disease are still being researched with controlled clinical studies.

Tocilizumab treatment is preferred for today in COVID-19 patients developing MAS symptoms for the easy accessibility of drugs. **Tocilizumab may be administered at 8 mg/ kg dose (max. 800 mg). Depending on the severity of symptoms, it may be administered at 400 mg or 800 mg IV at one time. Upon administering the first dose of 400 mg, 200-400 mg dose may be repeated within 12-24 hours, considering the changes in clinical and laboratory findings.**

Repeated administration of tocilizumab (200 or 400 mg) in patients with ongoing MAS symptoms despite responsiveness in total 800 mg should be subject to abstention. It must be decided only after consultations with rheumatology and/or hematology experts and considering alternative options of treatment.

Tocilizumab must not be used in case of pregnancy, neutropenia (<500/mm3), active tuberculosis, active hepatitis B or C, allergy and hypersensitivity and liver functions and thrombocyte counts should be monitored and patients with a history of diverticulitis should be monitored for gastrointestinal perforation.
13.2.7.3. Implementation of Tocilizumab Treatment

Draw fluid in a volume equal to tocilizumab concentration (10 ml for 200 mg, 20 ml for 400 mg and 40 ml for 800 mg ml) calculated for the patient under aseptic conditions from sterile 100 ml isotonic sodium chloride (0.9 %) solution. Draw concentrated tocilizumab from the vial at the applicable amount and add it into an infusion bag of 100 mL. The final fluid volume in the infusion bag should be 100 mL. The solution inside the bag should be mixed by slowly inverting without frothing and administered as intravenous within one hour.

13.2.7.4. Monitoring Patients Treated with Tocilizumab

Due to the fact that CRP values may drop independent from the clinical effectiveness of the drug after tocilizumab treatment, additional examinations should be used in following the responsiveness of acute phase (such as serum IL-6 levels, serum amyloid A protein). It should be known that the drop in ferritin values may not be fast in case of response to treatment, and persistence of high values for a certain period should not be deemed as the failure of treatment. Moreover, inflammation symptoms (fever, leucocyte, CRP, ferritin, etc.) as well as hypoxia, respiratory failure, shock, and multiple organ failure must be taken into consideration in evaluating the effectiveness of treatment.

It should be considered that inflammation indicators such as fever, CRP, leucocyte increase might have been suppressed when secondary infections are developed in patients on anti-cytokine treatment and additional examination should be referred to such as blood and tissue cultures and procalcitonin for diagnosis.

13.2.7.5. Other Options in Treatment of MAS

Anakinra (recombinant IL-1 receptor antagonist, Kineret 100 mg ready-to-use injector) treatment is also a safe option in patients developing MAS symptoms. Advantages such as short half-life (4-6 hours) and adjustable dose (2-10 mg/kg) and administration method (subcutaneous or intravenous) may offer a safer treatment option. The dose may be adjusted from a subcutaneous injection of 100 mg once or twice a day or of 200 mg IV 3 times a day in case of very severe symptoms depending on the severity of patient manifestations. The daily dose may be decreased in responding patients, and administration of necessary dose may continue as per need. Since it does not directly inhibit CRP synthesis like tocilizumab, it may be used as a safe test in monitoring CRP acute phase in patients on anakinra treatment.

Corticosteroids must be avoided to the extent possible; however, it is suggested to implement in compulsory cases as mentioned in ESICM guidelines provided not to exceed 0.5-1 mg/kg upon the emergence of persistent shock and ARDS.
In cases where anti-cytokine treatment fails to be sufficient, JAK inhibitors (ruxolitinib and others) may be used. IVIg treatment may also be administered in total of 2 days at 2 g/kg/day provided to monitor Ig levels (not to be used in deficiency of IgA).

Close monitoring and treatment plans should be performed in terms of coagulopathies developing with sepsis manifestations and MAS symptoms and especially disseminated coagulopathy symptoms.

As a consequence, biological anti-cytokine treatments such as tocilizumab and anakinra may be carefully used only in COVID-19 patients who develop the aforementioned MAS clinical and laboratory symptoms to suppress uncontrolled inflammation responses. If necessary, rheumatology and/or hematology experts should be referred to in determining the time and dose of treatment. **Anti-cytokine treatments should be used as an alternative therapy method to COVID-19 pneumonia patients who fail to respond to standard treatment, and any patients on such treatment should be closely monitored for secondary and opportunistic infections.**

**13.2.8. Coagulopathy Management in the Course of COVID-19**

It was observed that thromboembolic case has developed with various mechanisms in the course of COVID-19.

Possible mechanisms can now be collected with three effect mechanisms.

1. Related with virus attachment to ACE2 and/or direct endothelium damage
2. Associated with vascular micro-thrombotic disease observed in sepsis (endothelium damage with complement activation and inflammatory and micro-thrombotic pathway activation)
3. Associated with stasis developed in patients related to immobility/hospitalization

Experiences reported in China, Wuhan suggest that fatality was observed more frequently in coagulopathy developing patients.

**Suggestion:**

Coagulopathy monitoring should be initiated upon diagnosis of patients (Table 3). Monitoring should be performed once in 1-2 days with intravascular coagulopathy scoring (ISTH Criteria for Disseminated Intravascular Coagulation (DIC)).
Table 3. Necessary indicators of coagulopathy in the course of COVID-19

<table>
<thead>
<tr>
<th>Laboratory Request</th>
<th>Significant Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thrombocyte</td>
<td>&lt;100.000 /µl: (sepsis and high mortality)</td>
</tr>
<tr>
<td></td>
<td>&lt;150.000/µl: (messenger of a more severe course)</td>
</tr>
<tr>
<td>PT</td>
<td>3 seconds of prolongation: (patient with YBU indication probability)</td>
</tr>
<tr>
<td>aPTT</td>
<td>5 seconds of prolongation</td>
</tr>
<tr>
<td>Fibrinogen</td>
<td>&lt;150mg/dl (According to ISHT, DIC diagnosis, high mortality)</td>
</tr>
<tr>
<td>D-Dimer</td>
<td>x 4 increase (high-risk patient)</td>
</tr>
</tbody>
</table>

Studies performed indicate a notable decrease in mortality with the use of heparin in COVID-19 patients.

The key to the success of heparin is associated not only with its anticoagulant effect but also the ability to bind inflammatory cytokines, inhibit neutrophil chemotaxis and leukocyte migration, neutralize positive positron peptide C5a and sequester acute-phase proteins.

**Warning:** It is observed that coagulopathy often becomes evident on the 7th day of viremia. Plasma tissue factor and plasminogen activator inhibitor-1 were found to be higher in patients who have developed ARDS than those who have not developed ARDS.

Figure 6. Coagulopathy timing in the course of COVID-19

D-Dimer increase has not been made clear in the management of COVID-19-associated coagulopathy (threshold not yet clear; suggested with an experience of x6 — 8 times) and/or it was reported that initiation of heparin in case of SIC criteria > 4 decreased mortality (Table 4)
Table 4. Sepsis Induced Coagulopathy (SIC) is diagnosed if scoring is > 4

<table>
<thead>
<tr>
<th></th>
<th>0 point</th>
<th>1 point</th>
<th>2 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT</td>
<td>&lt; 1.2</td>
<td>&gt; 1.3</td>
<td>&gt; 1.4</td>
</tr>
<tr>
<td>Thrombocyte ((x10^9/L))</td>
<td>&gt; 150</td>
<td>&lt; 150</td>
<td>&lt; 100</td>
</tr>
<tr>
<td>Total SOFA (4 criteria)</td>
<td>0</td>
<td>1</td>
<td>&gt; 2</td>
</tr>
</tbody>
</table>

Stasis-related venous thromboembolism prophylaxis developing in patients associated with immobility/hospitalization: The risk of immobility-related stasis and stasis-related thromboembolic case in hospitalized patients also occurs in COVID-19 patients, like in every patient. High D dimer and fibrinogen degradation products are indicators of bad prognosis.

13.2.8.1. Monitoring and treatment of coagulopathy in COVID-19 patients

Upon diagnosing the patients, coagulopathy monitoring should be started. Thrombosis heparin prophylaxis should be applied to all COVID-19 patients.

No routine screening is suggested for rare cases whose Antithrombin III deficiency is between 1/500 – 1/5000 frequency. It is suggested to maintain heparin prophylaxis until inflammation symptoms improve.

**Thrombosis prophylaxis in patients with D –dimer <1000ng/ml**

CrCl >: 30ml/min.:  
BMI <40kg/m2: Enoxaparin 40mg/day  
BMI > 40/kg/m2: Enoxaparin 40mg 2x1 sc  

CrCl < 30ml/min.  

In general, low molecular weight heparin is not recommended. Standard heparin 5000 U sc 2x1 or 3 x 1 or dose reduced low molecular weight heparin is recommended.

**Patients with D-dimer >1000ng/ml or severe affection**

Enoxaparin: 0.5mg/kg one sc per 12 hours  
CrCl < 30ml/min: Standard heparin 5000 U sc 2x1 or 3 x 1 or dose reduced low molecular weight heparin is recommended.
Patients with a history of previous arterial fibrillation or venous thrombosis

>90 days: No change in heparin protection.

<90 days: Heparin production performed at treatment dose.

<table>
<thead>
<tr>
<th>Blood Count</th>
<th>Hgb &lt;7 gr/dl: 1 Ü erythrocyte suspension</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thrombocyte &lt;20,000/µl: 1 apheresis thrombocyte or pool thrombocyte of 2-4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pneumatic pressure</th>
<th>It will be useful to apply intermittent pneumatic pressure for each immobile patient.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patients with thrombocyte count &lt;30,000/µl are suggested mechanic thromboprophylaxis.</td>
</tr>
</tbody>
</table>

13.2.8.2. Management of arterial thromboembolic case protection

In patients who are on oral anticoagulants or K vitamin antagonists due to a history of arterial fibrillation, stroke, or venous thromboembolism, switching to low molecular weight heparin should be considered.

RAS pathway is activated once the virus initiates decreases in ACE2 expression. Activation of RAS, developing thrombocyte adhesion and aggregation, poses a risk of pulmonary emboli, pulmonary hypertension, and fibrosis in theory.

Dipyridamole (DIP) as anti-inflammatory and antiaggregant: A study in China deduced that DIP treatment in a couple of COVID patients who have been administered DIP (150mg/day) prevented hyper coagulopathy. In addition to the antiaggregant and anti-inflammatory effect of DIP, its phosphodiesterase effect and antiviral effect preventing viral replication have also been suggested in support of in vitro study. The effectiveness of C5a inhibitor eculizumab in TTP-like thrombotic microangiopathy associated with cytokine secretion and endothelium damage is under clinical trial.

13.2.8.3. Hemorrhage in COVID-19 Patients

A decrease in serum fibrinogen level is frequently observed from day 7.
Table 5. Disseminated Intravascular Coagulation (DIC); ISTH Criteria >5 points indicates DIC.

<table>
<thead>
<tr>
<th></th>
<th>±10^9/L</th>
<th>0 Point</th>
<th>±1 Point</th>
<th>±2 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thrombocyte x 10^9/L</strong></td>
<td>&gt;100</td>
<td>0 Point</td>
<td>±1 Point</td>
<td>±2 Points</td>
</tr>
<tr>
<td></td>
<td>50 - &lt;100.</td>
<td>+1 Point</td>
<td>+2 Points</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt; 50</td>
<td>+2 Points</td>
<td>+3 Points</td>
<td></td>
</tr>
</tbody>
</table>

|                        | None   | 0 Point | ±2 Points | +3 Points |
| **Increase in D-dimer/fibrinogen degradation products** | Moderate Increase | +2 Points | +3 Points |           |
|                        | Severe increase | +3 Points | +4 Points |           |

|                        | < 3 seconds | 0 Point | ±1 Points | ±2 Points |
| **PT prolongation**    | 3 - < 6 seconds | +1 Points | +2 Points |           |
|                        | > 6 seconds  | +2 Points | +3 Points |           |

|                        | >1       | 0 Point | ±1 Point |           |
| **Fibrinogen g/L**     | <1       | +1 Point | +2 Points |           |

Management of DIC

Coagulation factor replacement **must not be performed in patients with no hemorrhage unless necessary.**

If there is major hemorrhage with DIC diagnosis, it would be more suitable to consider blood product replacement.

Major hemorrhage is defined where blood pressure < 90mm Hg and/or heart apex beat > 110 /minute.

1. **Thrombocyte transfusion:** In case thrombocytopenia is <50,000/µl, 1 apheresis unit or 1 poor unit of 4 is used.

2. **Fresh frozen plasma:** In case of hemorrhage and PT (3sec) and/or prolonged aPTT (5sec), fresh frozen plasma is administered in 10 – 15ml/kg around 4 units per every 6-8 hours.

3. **Hypofibrinogenemia (<150mg/dl):** 4 units of fresh frozen plasma or 1U/10kg cryoprecipitate or 3-4gramfibrinogen may be administered.

Non-evidence-based approaches may include antithrombin, recombinant thrombomodulin, and hydroxychloroquine based extreme generation of thrombin.

Antiviral agents may play a role in the tendency to hemorrhage:

**Ribavirin:** effects warfarin dose.
**Lopinavir/ritonavir:** During the coadministration of CYP3A-mediated drugs (rivaroxaban and apiksaban), the dose should be decreased or coadministration should be discontinued. In addition, CYP3A4-mediated inhibition on P2Y12 inhibitors may have an effect. And thus, clopidogrel and prasugrel cause a decrease in active metabolite serum concentration while ticagrelor level increases.

**NOTE:** It is recommended to adjust the low molecular weight heparin dose according to clinical observations of a physician, Body Mass Index, and CrCl status of the patient.
14. MANAGEMENT AND TREATMENT OF CHILD PATIENTS WITH COVID-19

No data is yet available with sufficient scientific evidence about the treatment of COVID-19 infection in child patients. Therefore, suggested treatments for COVID-19 in child patients should be evaluated in accordance with the studies on adults and should be planned in specific to a child patient. No deaths have been reported between ages 0 and 9 throughout the world from the beginning of the COVID-19 outbreak until March 22, 2020. In adolescents, the rate is reported to be 0.2% between ages 10 and 19. In the light of such figures and data that has been shared until today, it is apparent that clinical manifestations in children are of the mild form. Moreover, probable adverse effects of drugs must be taken into consideration in the decision for treatment in child patients. For today, treatment must be respectively evaluated for every patient in childhood, and any probable severe cases must also be duly planned.

14.1. Triage

» Child patients suffering from fever, cough and respiratory distress, and their parents should wear surgical masks and be transferred to a special triage section.

» Physicians and nurses at triage should wear personal protective equipment (apron, medical mask, goggles/face protector, gloves) to enter into the patient section.

» Vital symptoms should be checked (heart rate, rhythm, respiratory rate, blood pressure, body temperature, and oxygen saturation, if possible).

» Patients who are unstable in general should be provided with ventilatory support and immediately hospitalized in the relevant department.

» Patient anamnesis should be taken.

» Patient should be examined.

14.2. COVID-19 Test

14.2.1. Epidemiological Properties

» Evaluation of household members;

» Any members of the same household who has been hospitalized with respiratory tract infection diagnosis within the last 14 days,

» Any members of the same household who has been diagnosed with COVID-19,

» Any members of the same household who has fever and cough, or who suffer from respiratory distress either with fever or not,
» Any history of contact with an individual diagnosed COVID-19,

14.2.2. **Complaints and Symptom Findings**

» History of fever in child patient or body temperature at or above 38.0°C,

» Existence of any findings during auscultation,

» Existence of tachypnea,

» New-onset cough,

» Oxygen saturation at or less than 92% in room air.

COVID-19 PCR Test should be ordered in cases where;

1. At least one of I and II is available;

2. At least two of II are available (for each option, failure to indicate any association with another reason),

3. Two or more members of the same household are diagnosed with COVID-19,

4. Infants at most 9 months diagnosed with COVID – 19.

14.3. **Laboratory and Imaging Techniques**

» Analyses are requested;

» Blood analyses: Complete blood count, urea, creatinine, sodium, potassium, chlorine, AST, ALT, total bilirubin, LDH, CPK, D-dimer, troponin, C-reactive protein may be requested if the physician deems necessary.

» Imaging:

» In the case where at least one of I and II testing criteria is available, and if any auscultation finding is available, low dose CT is suggested, lung x-ray may also suffice depending on the age of patient and severity of findings.

» Chest x-ray is conducted. Lung CT scan may also be conducted depending on the status of the patient, whose respiratory system findings cannot be explained with a chest x-ray or who deteriorate clinically.

14.4. **Medical Treatment**

» No data is yet available with sufficient scientific evidence about the treatment of COVID-19 infection in child patients. Therefore, suggested
treatments for COVID-19 in child patients should be evaluated in accordance with the studies on adults and should be planned according to the status of the child patient. Severe clinical findings and deaths are rarely reported in child patients.

» Probable adverse effects of drugs must be taken into consideration in the decision for treatment in child patients.

» Doses and duration of drugs to be used are provided in Table 1.

» Treatment should be evaluated in specific to each child patient, and medication may be planned for patients with probable severe pneumonia and mild cases with risk factor (severity symptoms of pneumonia are given in Table 2 and Table 3).

» The use of hydroxychloroquine in child patients under the age of 6 is not approved. If it is to be used, the “Informed Consent Form” must be filled in.

14.5. Chest x-ray Findings

» Chest x-ray may be normal in the early stages.

» However, unilateral or bilateral multifocal patched ground-glass opacities and accompanying consolidations may be observed in severe cases.

14.6. Thoracic CT Findings

» Unilateral or bilateral patched involvement or ground-glass opacities are observed.

» Peripheral and subpleural involvement may occur.

» Ground glass is generally observed on the first days and may progress to consolidation in the following days.

» Lymphadenopathy is not generally observed, and pleural effusion is rare.

» In general, a normal thoracic BT helps excluding COVID-19.

Significant Considerations

» Tachypnea (respiratory rate > 60/min for newborns less than 2 months; >50/min for infants between 2-12 months; >40/min for toddlers between 1 and 4 years and >30/min for children above 5 years old)

» Respiratory distress (withdrawal, cyanosis, unease, nasal flaring, and tachypnea),

» Decreased nutrition, dryness in oral mucosa, decrease in urine

» Fever higher than 38.5 °C or high fever persisting for 3-5 days

» Recurrence of symptoms after partial recovery
Children under risk factor

» Underlying immune-deficiency or history of immunosuppressive medication

» Chronic diseases (diabetes, renal disorders, heart conditions, chronic lung disease, hematologic diseases, and metabolic disorders)

Table 6. Doses and Administration Methods of Drugs to be Used in Childhood Treatment

<table>
<thead>
<tr>
<th>Name of Drug</th>
<th>Daily dose and administration method on child patients</th>
<th>Duration of therapy (day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Preference</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydroxychloroquine, 200 mg tablet</td>
<td>First day 6.5 mg/kg/dose, 2 times a day Hydroxychloroquine sulphate; maximum dose on first day: 400 mg/dose; continuing on days 2-5 at 3.25 mg/kg/dose, 2 times a day Hydroxychloroquine sulphate: maximum dose 200 mg/dose Babies 1-5 months 10mg/kg/dose (max dose 500mg/dose) Children &gt; 6 months and adolescents 10mg/kg first day single dose (max dose 500 mg/dose), Continuing at 5 mg/kg per day single dose for 2-5 days (max dose 250 mg/dose) total 5 days</td>
<td>5 days</td>
</tr>
<tr>
<td>Azithromycin 200 mg/5 ml susp 500mg tb¹</td>
<td></td>
<td>5 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Alternative Treatment or in case of Progress</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lopinavir 250 mg/ritonavir 50mg tablet²</td>
<td>Babies between 14 days - 6 months: Lopinavir component 16 mg/kg PO BID Children between 6 months- 18 years: 15-25 kg: 200 mg-50 mg PO BID 26-35 kg: 300 mg-75 mg PO BID &gt;35 kg: 400 mg-100 mg PO BID</td>
<td>10-14 days</td>
</tr>
</tbody>
</table>

Additional suggestions to antiviral treatment in confirmed COVID-19 patients who have been put into the intensive care unit yet suffer from organ dysfunction despite supportive therapy; please refer to the intensive care treatment in the guidelines for patients developing MAS or hemophagocytic syndrome.

**NOTE:** Oseltamivir should be given to cases with clinic manifestations complying with influenza, or where influenza cannot be excluded due to season and other factors or those testing positive for a diagnosis of influenza. Oseltamivir is not recommended for the treatment of COVID-19.

¹ Both azithromycin and hydroxychloroquine may extend the QT range and cause a tendency to ventricular tachycardia. Therefore, azithromycin must not be used in patients with other clinical manifestations that extend QT. In other cases, the patient should be applied ECG if necessary and monitory closely, and first azithromycin should be discontinued in case of any cardiototoxic adverse effects and then the dose of hydroxychloroquine should be decreased and if problems persist, should be discontinued.
Safety, effectiveness, and pharmacokinetic profiles of lopinavir and ritonavir have not been defined in newborns less than 14 days. In newborns less than 14 days and in particular, in preterm newborns, there is a risk of developing propylene glycol toxicity with the use of lopinavir/ritonavir oral solution. The oral solution contains ethanol and propylene glycol and competitively inhibits ethanol propylene glycol metabolism. Post-marketing reports indicate cardiotoxicity (full AV block, bradycardia, cardiomyopathy), lactic acidosis, central nervous system depression, respiratory complications, acute renal failure, and death in premature babies following the use of the oral solution. Unless the baby is closely monitored and benefits outweigh the risks, it should not be used in the postpartum period, including full period newborns less than 14 or premature newborns up to 14 days after the date of birth. Dosage once a day (oral solution or tablets) is not an approved regime for children under the age of 18.

Table 7. Rating of pneumonia severity by age *

<table>
<thead>
<tr>
<th></th>
<th>Mild-Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infant</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever</td>
<td>&lt; 38.5 °C</td>
<td>Fever &gt; 38.5 °C</td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>&lt; 50/min.</td>
<td>Respiratory rate &gt; 70/dk</td>
</tr>
<tr>
<td>Mild withdrawal on chest</td>
<td></td>
<td>Moderate/severe withdrawal on chest</td>
</tr>
<tr>
<td>Fed orally</td>
<td>Nasal flaring</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cyanosis or hypoxia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermittent apnea</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Groaning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cannot be fed</td>
</tr>
<tr>
<td><strong>Child</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever</td>
<td>&lt;38.5 °C</td>
<td>Fever &gt; 38.5 °C</td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>&lt; 50/min.</td>
<td>Respiratory rate &gt; 50/min.</td>
</tr>
<tr>
<td>Mild respiratory distress</td>
<td>Severe respiratory distress</td>
<td></td>
</tr>
<tr>
<td>No vomiting</td>
<td>Nasal flaring</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cyanosis or hypoxia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Groaning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dehydration</td>
</tr>
</tbody>
</table>
Table 8. Clinical classification in pneumonia *

<table>
<thead>
<tr>
<th></th>
<th>Pneumonia</th>
<th>Severe pneumonia</th>
<th>Very severe pneumonia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consciousness</strong></td>
<td>Normal</td>
<td>Possible somnolence</td>
<td>Lethargy/confusion/no response to the painful stimulus</td>
</tr>
<tr>
<td><strong>Groaning</strong></td>
<td>None</td>
<td>Possible</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>Normal</td>
<td>Pale</td>
<td>Cyanotic</td>
</tr>
<tr>
<td><strong>Respiratory Rate</strong></td>
<td>Tachypneic</td>
<td>Tachypneic</td>
<td>Tachypneic -Apneic</td>
</tr>
<tr>
<td><strong>Withdrawal on Chest</strong></td>
<td>None</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Nutrition</strong></td>
<td>Normal</td>
<td>A decrease in oral intake</td>
<td>Cannot feed</td>
</tr>
<tr>
<td><strong>Dehydration</strong></td>
<td>None</td>
<td>Possible</td>
<td>Yes (shock symptoms)</td>
</tr>
</tbody>
</table>

*Resource: Consensus Report on Diagnosis and Treatment of Pneumonia Developed in Community in Children, Turkish Thoracic Society, 2009

Any wastes from probable/confirmed COVID-19 cases should be disposed of in accordance with the regulations on medical wastes.

If healthcare workers attending to patients with COVID-19, find any symptoms or findings in themselves within 14 days after contact with the patient that may suggest acute disease, they must immediately inform concerned physicians.
15. TERMINATION OF ISOLATION IN COVID-19 PATIENTS

15.1. Termination of Isolation of Hospitalized Patients

The COVID-19 patients under inpatient treatment and monitoring who does not present any fever and need for oxygen within the last 48-72 hours and fit the criteria for home monitoring may be discharged after their treatment is determined subject to approval by the physician. Their home isolation may be terminated on the 14th day following the date of discharge provided not to manifest any symptoms or fever. Patients discharged and allowed for home monitoring should be managed according to the rules of “Monitoring Patients at Home”.

15.2. Termination of Isolation of Home-Care Patients with no Indication of Hospitalization

Home isolation of home-care patients with no indication of hospitalization should be terminated at earliest on 14th day following the improvement of symptoms. Patients allowed for home care should be managed according to the rules of “Monitoring Patients at Home”.

15.3. Termination of Isolation of Healthcare Worker

Termination of isolation of COVID-19 healthcare workers requires 2 consecutive negative test results performed at least every other 24 hours provided to be at earliest on 3rd and thereafter following the improvement of symptoms and after the first 7 days following the onset of symptoms. After such a period, healthcare workers may be allowed to return to work.
16. EVALUATION OF HEALTHCARE WORKERS IN CONTACT WITH PATIENTS

Current evidence suggests that COVID-19 can be transmitted through close contact and droplets among people. Healthcare workers or caregivers have the highest risk of infection. Therefore, healthcare workers who provide care to such patients are considered as high risk, and the protection of healthcare workers is considered as one of the most important priorities. This section will explain how to evaluate the healthcare workers who are in contact with COVID-19 patients under categories by their actions during contact and measures are taken.

Table 9. Evaluation of Contact of Healthcare Worker with COVID-19 Patient

<table>
<thead>
<tr>
<th>Use of Personal Protective Equipment (PPE) by Healthcare Worker</th>
<th>Contact Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intense contact with COVID-19 patient with medical (Surgical) mask equipped</td>
<td></td>
</tr>
<tr>
<td>Medical mask or N95 not used or medical mask used in case of N95 indication</td>
<td>Average</td>
</tr>
<tr>
<td>No eyewear used</td>
<td>Low</td>
</tr>
<tr>
<td>No gloves and apron used</td>
<td>Low</td>
</tr>
<tr>
<td>Used all PPE properly</td>
<td>Risky</td>
</tr>
<tr>
<td>Not to be evaluated</td>
<td></td>
</tr>
<tr>
<td>Intense contact with COVID-19 patient without wearing a medical mask</td>
<td></td>
</tr>
<tr>
<td>Medical mask or N95 not used</td>
<td>High</td>
</tr>
<tr>
<td>Use of medical mask in case of N95 indication</td>
<td>Average</td>
</tr>
<tr>
<td>No eyewear used</td>
<td>Average</td>
</tr>
<tr>
<td>No gloves and apron used</td>
<td>Low</td>
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<tr>
<td>Used all PPE properly</td>
<td>Risky</td>
</tr>
<tr>
<td>Not to be evaluated</td>
<td></td>
</tr>
</tbody>
</table>

Short conversations at triage desk, short-term entries into the patient room without contacting the patient, and entering the discharged patient’s room are not considered as at risk.

» Healthcare workers, who accompany the patient during a walk, who do not contact the patient and their excretions and who do not enter into the patient room, are not considered as at risk.

» Healthcare workers, who do not directly contact the patient, do not enter into the rooms where the patient is being actively cared, and who comply with routine safety rules, do not carry a risk of contact.
Intense contact with COVID-19 patient contains contacts during any of the following operations:

» Taking specimen from the respiratory tract
» Intubation
» Aspiration of respiratory secretions
» Non-invasive ventilation
» High-flow oxygen therapy
» Cardiopulmonary resuscitation
» Use of nebulizer
» Endoscopic operations
» Bronchoscopy
» Video laryngoscopy
» Dentistry applications
» Mouth-throat-nose examination
» Ophthalmologic examinations
» Attaching central catheters
**COVID-19 (SARS-CoV-2 INFECTION) GUIDE**

**LABORATORY ALGORITHM APPLICABLE BY RISK CATEGORIES FOR HEALTHCARE WORKERS IN CONTACT WITH PATIENTS**

**Healthcare Worker in Contact with patients**

**High-Risk**
- Hydroxychloroquine starts (for 3 days*), monitored at home for 7 days for active symptoms; PCR test is conducted on the day of symptom, if symptom develops, and on 7th day if symptoms do not develop

**Average Risk**
- Works with a mask on, monitored for active symptoms; PCR test is conducted on the day of symptom, if symptom develops, and on 7th day if does not develop

**Low Risk**
- Works with a mask to complete total duration up to 14th day after contact and symptoms are monitored
  - PCR test is conducted if a symptom develops

**PCR Test positive**
- Managed as per the definition of confirmed case, suspended chloroquine resumes up to 5 days
  - If the symptoms do not improve in those symptomatic, a PCR test is conducted 48 hours after the first test.

**PCR Test negative**
- Managed as per the definition of confirmed case
  - Managed as per the definition of confirmed case
  - Managed as per the definition of confirmed case
  - PCR test is conducted 48 hours after the first test if the symptoms do not improve

* Total 3 days, 2x200 mg.

* Although there exists no strong evidence to prove the effectiveness of hydroxychloroquine in prophylaxis, it is recommended for high-risk contacts.

* G6PD deficiency should be researched before the use of hydroxychloroquine.
17. MORGUE AND BURIAL SERVICES

17.1. Measures and Actions to be Taken for Morgue and Burial Services of the Deceased with COVID-19 Diagnosis

» Morgue and bathing cubicle workers should be trained about standard infection control measures and the importance of hand hygiene.

» Bathing cubicle workers should be informed that the corpse had an infectious disease. Bathing cubicle workers should wear gloves, medical (surgical) masks, eyewear/face protectors, and liquid-resistant aprons.

» Pressurized water may cause splatter of infected fluids on the corpse and aerosolization and, thus, should be avoided since it may cause transmission of disease.

» Any used personal protective equipment should be disposed of in a medical waste box.

» Bathing cubicle should be cleaned after bathing and disinfected with 1/10 bleach or chlorine tablet (upon suggested products).

» In the cases where the COVID-19 patient dies at home, burial should also be performed according to the aforementioned rules.

» Family members of the corpse must not hug and must not be in close contact with the corpse.

» Corpse should be enshrouded as usual and a body bag is not needed.

» Corpse should be put in a standard coffin.

» Corpse should be buried in regular graveyards without any further measures such as liming etc. on burial site and without any need for a special graveyard.

» As less as possible individuals should attend the funeral ceremony by keeping the social distance.

» Gloves will be sufficient to place the corpse into the burial chamber.

» No disinfection is needed for the corpse before and after burial.

» Personal belongings of the deceased should be placed in a double-fold nylon bag, and if such belongings are to be reused, they must be washed at 60-90 degrees. Disposal of such belongings should conform to the requirements of medical wastes.
17.2. Rules on the National and International Transport of People Died from COVID-19

Bodies to be transported nationally and internationally via airways, highways or railways should be placed into coffins and corpses should be buried within coffins.

17.2.1. Transport of Bodies by Airways

Transport of the deceased from COVID-19, national or international by airway, should be subject to the rules on the transport of bodies by national and international airways. Pursuant to the Guidelines on Courier Services of the Directorate General of Civil Aviation (Publication No: HAD/T-23) and the “Procedure on Transport of Bodies” by Turkish Airlines, “coffins of the bodies deceased from infectious disease must be strictly sealed, tightly enclosed to prevent any leakage during acceptance” and transport of bodies, nationally and internationally, must comply with the above criteria because the deceased from COVID-19 had an infectious disease.

17.2.2. Transport of Bodies by Highway and Railway

In all kinds of transport of bodies by highway and railway, coffins must be strictly sealed, tightly enclosed to prevent any leakage during acceptance to transports in a similar manner to transport by airways.

17.3. Methods and Rules Applicable to Non-COVID-19 Reasons

In the case of deaths due to non-COVID-19 reasons, burial should continue at standard procedures. However, suspicion of COVID-19 should be evaluated by the physician who examines the body. It is crucial to take personal protective measures for the examination of the body in all deaths due to the COVID-19 outbreak.
18. ACTIONS TO BE TAKEN BY VISITORS TO AFFECTED COUNTRIES

Travels to countries with a high or increasing number of cases should be delayed if possible and if necessary, possible visitors should follow the instructions below:

» Travelers should avoid contact with ill people (keep at least 1 m distance).

» Travelers should not visit health institutions if possible, due to a high number of ill people. They should minimize contact with other patients if it is necessary to visit health institutions.

» Travelers should regard recommendations on food safety (avoid consuming raw milk and animal products, wash vegetables and fruits thoroughly before eating raw).

» Travelers should avoid contact with wild animals and pets (live or dead).

» Travelers should follow hand hygiene and should clean their hands frequently. Hands should be washed thoroughly with water and soap for at least 20 seconds, and alcohol-based hand antiseptics should be used if there is no soap and water. Antiseptic containing soaps are not necessary; regular soaps will be enough.

» Travelers should cover their nose and mouth with a disposable paper tissue during coughing or sneezing or with their bent elbow when there is no paper tissue to minimize the infection of disease.

» Particularly in case of respiratory infection symptoms (fever, nasal flow, nasal congestion, sneezing, coughing, sore throat) the above instructions should be followed, hands should be washed frequently, crowded places should be avoided unless necessary. If it is necessary, mouth and nose should be covered and if possible medical masks should be worn. People with no disease should not necessarily wear masks.

Travelers should apply to a health institution in case of fever, cough, respiratory distress within 14 days after travel and report their history of travel.
Table 10. Products* and specifications recommended for surface cleaning and disinfection

<table>
<thead>
<tr>
<th>Product*</th>
<th>Place of use</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol Solutions (Ethyl/isopropyl) **</td>
<td>Stethoscopes, Pulse oximeters, Defibrillation pads</td>
<td>No toxicity, Low cost, Fast effect, No precipitations</td>
<td>Not an ideal surface disinfectant since it is volatile.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Extremely combustible.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hazardous for plastic, rubber, and silicon materials.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Deactivated by organic substances (therefore, surfaces must be cleaned before use).</td>
</tr>
<tr>
<td>Standard Bleach *** (1:10 normal dilution) (Sodium hypochlorite Cas No: 7681-52-9) **</td>
<td>Surfaces contaminated with blood and body fluids</td>
<td>Low cost, Fast effect, Easy to access, Ready for use tissues and sprays, Sporicidal and viricidal (against C.difficile and Norovirus)</td>
<td>Hazardous to metal equipment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Deactivated by organic substances (therefore, surfaces must be cleaned before use).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Irritant to skin and mucus membranes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Must be used within 24 hours after diluted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Leaves stains on clothes.</td>
</tr>
<tr>
<td>Standard Bleach *** (1:10 normal dilution) (Sodium hypochlorite Cas No: 7681-52-9) **</td>
<td>Exterior surfaces</td>
<td>Low cost, Fast effect, Easy to access, Ready for use tissues and sprays, Sporicidal and viricidal (against C.difficile and Norovirus)</td>
<td>Hazardous to metal equipment</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Leaves stains on clothes.</td>
</tr>
</tbody>
</table>
| Hydrogen Peroxide (0.5%) (Cas No: 7722-84-1)** | • Exterior surfaces of equipment  
• Floors  
• Walls | • Safe to environment  
• Non-toxic  
• Fast effect  
• Active in the availability of organic substance  
• Tissue and fluid form available  
• Perfect cleaning with detergent feature | • Hazardous to copper, zinc, brass, acrylic, and aluminum. |
|---|---|---|---|
| Quaternary ammonium compounds (Quats) | • Floors  
• Walls | • Not toxic  
• Non-corrosive  
• Good cleaning due to detergent feature | • Not to be used in the disinfection of medical devices.  
• Limited use as a disinfectant due to the narrow microbial spectrum. |

Adapted from the Provincial Infectious Disease Advisory Committee’s “Best Practices for Environmental Cleaning for Prevention and Control of Infections”.

* Products licensed with biocidal from the Ministry of Health should be used. These products may have different concentrations and, in some cases, may contain combined products, and therefore, the application must be used according to label instructions.

** Cas No: Chemical registry number

*** Products licensed with biocidal from the Ministry of Health may be of different concentrations and are used directly according to the label. There are different concentrations of bleaches used for cleaning purposes and those with reacting free chlorinity at 4-8% may be used

¹ See the Guidance for Protection against Infectious Diseases in Emergency Healthcare Services Before Hospital
19. SOURCES

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A Multinational Consensus Statement from the Fleischner Society

https://doi.org/10.1148/radiol.2020201365