THE REPUBLIC OF TURKEY
MINISTRY OF HEALTH
DIRECTORATE GENERAL OF
PUBLIC HEALTH

COVID-19
(SARS-CoV-2 INFECTION)
(Study of Scientific Board)

GENERAL INFORMATION, EPIDEMIOLOGY AND DIAGNOSIS

THE REPUBLIC OF TURKEY
MINISTRY OF HEALTH
30 MAY 2020

SUMMARY OF RECENT UPDATES

» Introduction has been updated.

» General information (epidemiology has been updated)

» COVID-19 (Source, mode of transmission, clinical features, laboratory tests sections have been updated)

» Case definition and case management have been updated

» Sample taking, storage and transport sections have been revised

» the use of thoracic computerized tomography in COVID-19 patients section has been updated

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INTRODUCTION

Coronaviruses (CoV) are a large family of viruses causing cold which is observed generally in the society and self-limiting mild infections 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 subspecies that circulate among humans are mostly viruses that cause colds. However, there are many coronavirus subspecies 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 bearcats cause infection of SARS-CoV 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 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 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.

The World Health Organization declared the COVID-19 outbreak “a public health emergency of international concern” on 30 January and made an assessment to characterize it as a global outbreak (pandemic) on 11 March due to the occurrence, spread and severity of virus in 113 countries to China where it first started. Studies about COVID-19 in country began on 10 January and the first meeting of the Scientific Advisory Committee of the Turkish Ministry of Health was held in 22 January and thanks to measures taken, the first case was seen on 11 March after Europe and our neighboring countries such as Iran. Our core strategy against the outbreak since the occurrence of first case has been to reduce the occurrence of disease and to flatten the curve while preventing the probability of heavy demand on healthcare services. The deterioration of COVID-19-related medical consequences (i.e. severe disease, need of intensive care, death, disability etc.) is avoided with field and clinical cooperation. Our national approach is to progressively mitigate the losses of outbreak, and to restrain and suppress the infection.

This guide has been issued to inform about COVID-19 infection chain (origin, mode of transmission, susceptible persons), case definitions and methods of diagnosis and to provide guidance about the management of outbreak as well as the strategies and applications that need to be followed in COVID-19 cases or contacts. The guide 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/).

I.GENERAL INFORMATION

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 rod like 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).

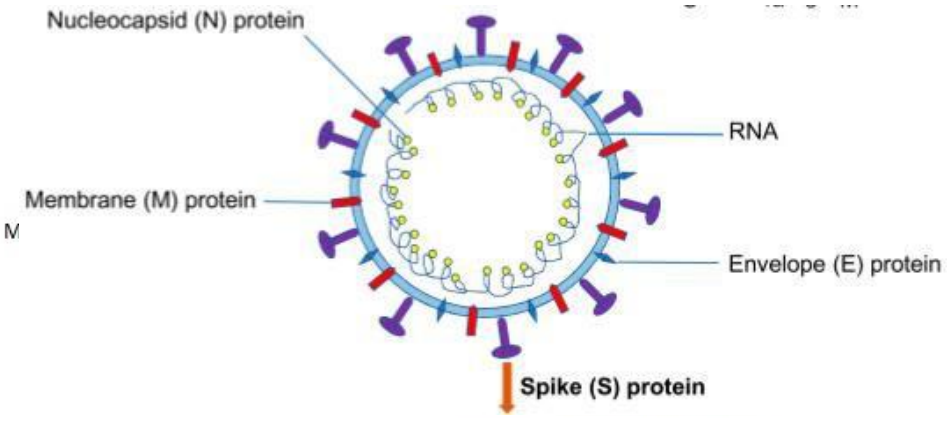

Figure 1. Schematic Structure of Coronavirus (*Zhou Y, Yang Y, Huang J, Jiang S, Du L. Advances in MERS-CoV Vaccines and Therapeutics Based on the Receptor-Binding Domain. Viruses. 2019 Jan 14;11(1)).*

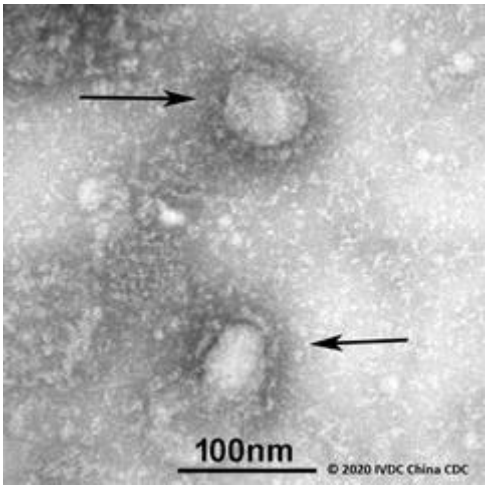

Figure 2: Electron microscope image of Novel Coronavirus (beta coronavirus) (*https://www.gisaid.org/,last accessed: 20.01.2020*)

Coronaviruses are in the *Coronaviridae* family, *Orthocoronavirinae* sub-family. Orthocoronovirinaea 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 coronavirus in humans can range from simple colds to 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 were 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).

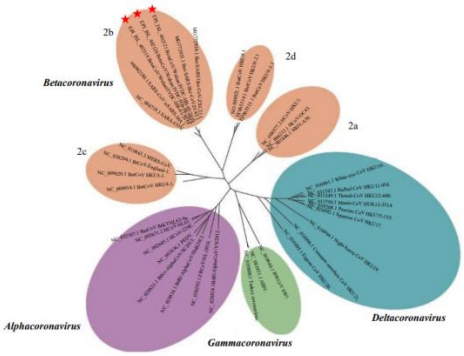

Figure 3: Phylogenetic relationship of the new *Coronavirus* (*Tan W, Zhao W, Ma X, et al. A Novel Coronavirus Genome Identified in a Cluster of Pneumonia Cases — Wuhan, China 2019−2020, Notes from the Field, China CDC Weekly*)

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.

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 deaths related to this infection has increased in Iran, the Republic of Korea (South Korea) and Italy. As of the beginning of March 2020, the infection is still continuing and almost all countries worldwide are reporting cases. 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. In the ongoing process, the number of cases is increasing not only around the world but also in our country. For detailed and updated information about the number of cases in our country, please refer to our Ministry’s https://covid19.saglik.gov.tr/ website.

II.COVID-19

Infection chain consists of the origin, mode of transmission and susceptible persons.

1. Source

The reservoir of SARS-CoV-2 is still being researched. All existing evidence for COVID-19 suggest that SARS-CoV-2 is of zoonotic origin. Though not clarified yet, available data indicate wild animals sold at Huanan Seafood Wholesale Market. Due to its ability to transmit from human to human, the source in COVID-19 is symptomatic/asymptomatic COVID-19 positive person.

2. Mode of Transmission

The disease is transmitted mainly through droplets. In addition, it is transmitted to 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 of such people.

In a metanalysis study performed by Khalili et. al, incubation period was calculated as 5.84 days in average (99% Confidence Interval 4.8-6.8). Median incubation period is 4.8 days. In general, incubation period varies between 2 and 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.

2.1. Contamination, Viral Load:

Viral scatter begins 1-2 days prior to onset of symptoms and viral load peaks during the onset of symptoms in throat swabs and rapidly falls within first seven days and may extend beyond second week. Certain studies suggest that due to the similarity of viral loads in symptomatic and asymptomatic/minimal symptomatic patients, asymptomatic persons play role in contamination. On the other hand, there are certain studies reporting that viral load is higher in severe cases. Virus is also detected at peak levels during the onset of symptoms in saliva samples taken from posterior pharynx. Viral is typically suppressed within the first 10 days in mild patients, while it takes longer in severe patients; nasopharyngeal swab and stool samples (generally longer periods) may point out to a period longer than one month. Although viral RNA is found negative in two successive respiratory samples from time to time, it may become positive again subsequently. It is considered that such positive rates result from methodological reasons rather than reactivation/reinfections. Even though virus is found positive in stool in particular after 2nd week of disease, the fact that the virus has been reproduced from only one patient's stool sample until now and no transmission in such way has been reported until now, no probability of fecal-oral transmission is considered. Virus is found rarely in blood and urine, and virus is considered to pose no safety issue as to blood banking. Apart from that, virus is not found in milk, vaginal swab and sperm samples. Viral load is higher in the elderly and is an important indicator as to the severity and prognosis of disease. Viral load is found to be 60 times more in severe cases than mild cases.

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.

2.2. Susceptible Person/Host:

The entire community is susceptible to COVID-19. Healthcare workers are the occupational group at highest risk as to encountering with the agent. Males, people aged over 50 years, people with comorbidities (i.e. hypertension, cardiac disease, diabetes, malignity, COPD, renal disorders etc.), seasonal agricultural workers and people who live in nursing and rehabilitation centers, schools, military posts, prisons and detention houses and immigrant camps are groups vulnerable to COVID-19.

Basic reproduction number: R_0: is the number of different individuals that one infected individual in an entirely susceptive community may infect throughout the infective duration. If R_0 is larger than 1, each available infection may cause more than one new infection. Disease spreads amongst people and may cause an outbreak. Modellings report that R_0 is between 2.76 and 3.25 in Italy, and average R_0 3.28 and median R_0 2.79 in China for COVID-19. The highest R_0 value was reported as 14.8 on board Diamond Princess Cruise at the onset of pandemic. Calculations for Turkey suggest that R_0 value was 9.6 on day 10 of outbreak, while it was 1.30 on day 45. Basic reproduction number should be calculated at certain intervals of outbreak and considered as one of the tracking criteria of outbreak.

Herd Immunity refers to where a certain rate of individuals in a community become immune to a specific infectious disease, the entire community is protected against such disease. When R_0 is taken as 2.2, herd immunity is calculated as 60% for COVID-19.

3. Clinical Features

New information is added to those related to the natural course of COVID-19 as a result of studies performed during pandemic period.

Common symptoms of infection are respiratory symptoms, fever, cough, and dyspnea. Headache, sore throat, nasal flow, muscle and joint pain, lethargy, newly emerging loss of sense of smell and palate, diarrhea etc. may also be seen. Although disease may be on asymptomatic basis, in severe cases pneumonia, severe acute respiratory infection, kidney failure, and even death may develop.

While the fatality rate was 11% in 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. This rate is 2,6% as of 2 May 2020 in our country.

Asymptomatic infection: In literature, population-based screenings have also reported positive quantitative RT-PCR tests (nasopharyngeal swab sample) in asymptomatic individuals. Most of asymptomatic cases have developed certain symptoms in further stages of infection yet there are asymptomatic cases who remained so throughout clinical monitoring period.

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). -19-authorized-diagnostic-laboratories-list). 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.

4.1. Nucleic acid amplification tests (NAAT)

Routine validation of COVID-19 cases, 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 when necessary, it is based on verification by sequence analysis method. 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, S and RdRp genes for molecular tests have been published so far, a simpler algorithm such as scanning with a single descriptive targeted rRT-PCR, for example is sufficient where the SARS-CoV-2 virus is commonly observed. The possibility of COVID-19 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
- For example, collection of the sample in too early or late phase of infection,
- For example, sample's being not properly processed and sent,
- Technical causes inherent in the test, such as PCR inhibition or virus mutation
- Fluctuating scatter of SARS-CoV-2 virus in symptomatic and asymptomatic cases

When a negative result is obtained from a patient with a high suspicion of COVID-19 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.

4.2. Sequencing

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

4.3. Serological Tests

Individual, who have undergone COVID-19, either asymptomatically or symptomatically, in general develop antibody response after a certain while (IgM, IgA ve IgG). Therefore, serological tests may not be used for diagnosis purposes at the early stages of disease. The first antibody response (IgM) begins 6-7 days later while positive antibody signs develop 10 days after in most of the patients. It is not yet certain if antibodies provide immunity or not or for how long (IgG).

In order to specify the serological response, ELISA or IgM/IgG-detecting rapid antibody tests are currently being used.

Reliable antibody tests can be used for various purposes:

1) In cases with negative NAAT tests and strongly correlated epidemiologically with COVID-19 infection, working on serological tests in serum samples taken at acute and/or convalescent phase may support diagnosis.
2) Serological tests help researching the ongoing outbreak while ensuring that attack rate and outbreak severity are evaluated retrospectively.
3) UTS-registered validated tests can be used for monitoring and evaluating purposes.
4) The performance of antibody tests varies by seroprevalence in the respective community. Especially in cases where seroprevalence is low and due to the fact that false positive in such tests may cause misleading results and misinterpretations, seroprevalence studies must be carefully built and interpreted.
5) Further data and experiences other than those specified by the manufacturers with regard to the performance characteristics of available kits are limited and therefore, it is difficult to make general suggestions as to their uses other than intended purposes mentioned above.

III. CASE DEFINITION AND CASE MANAGEMENT

3.1. Probable Case:

A:

- At least one of the signs and symptoms of fever, cough, shortness of breath, sore throat, headache, muscle pains, loss of sense of palate and smell or diarrhea AND
- Inability to explain the clinical manifestation with another cause / disease AND
- A history of himself or close contact being in the high-risk zone for disease within 14 days before the onset of symptoms

OR

B:

- At least one of the signs and symptoms of fever, cough, shortness of breath, sore throat, headache, muscle pains, loss of sense of palate and smell or diarrhea 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-Severe Acute Respiratory Tract 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 findings and changes in consciousness.*

OR

D:

- At least two of the signs and symptoms of fever, cough, shortness of breath, sore throat, headache, muscle pains, loss of sense of palate and smell or diarrhea and inability to explain the case with any other reason/disease.

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.

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.

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HEALTH INSTITUTION

- In each inpatient treatment institution, the personnel who will register the case to the (HSYS) Public Health Management 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 diagnosis code U07.3 ICD 10 within the scope of the Communicable Diseases Reporting System.
- All cases are recorded in the HSYS starting from the probable case.
- By taking the appropriate sample from the cases, * COVID-19 examination order is conducted over HSYS.
- The sample, which is ordered through HSYS, is sent to the relevant laboratory in immediate manner according to the procedure determined through Provincial Health Directorate or according to the procedure determined by the Health Directorate.
- Probable / confirmed cases are admitted and treated in an isolated manner 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 secondary adult intensive care unit also serve as a pandemic hospital.
- Daily monitoring info about cases recorded to HSYS are entered into the system

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PROVINCIAL DIRECTORATE OF HEALTH (İSM)

- It ensures that samples taken from inpatient treatment institutions are sent to the relevant laboratories immediately and under appropriate conditions.
- In case of case cluster suspicion in surveillance data, epidemiological connection between cases is investigated.
- Contact inquiries and contact tracing 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 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.

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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)

IV. 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 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.

PATIENT WITH SYMPTOM

If detected during 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 are 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 in accordance with the Possible Case Follow-up Algorithm.

PATIENT WITH SYMPTOM

If detected in 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 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.
- Person who comply with the probable case definition are informed to the Provincial Health Directorate and 112 Command and Control Centers and transferred to a hospital with suitable facilities and multidisciplinary conditions through 112 Emergency Health Services.
- 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.
- The airlines used by such person is communicated with to obtain information about two front, two back and two side seats of the relevant person and the Provincial Health Directorate is informed accordingly for contact tracing.

2) In cases that do not comply with the probable case definition:

• The transit passenger is allowed in 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.

V. 5.COLLECTION, STORAGE AND TRANSPORT OF SAMPLES

5.1. 5.1.Sampling

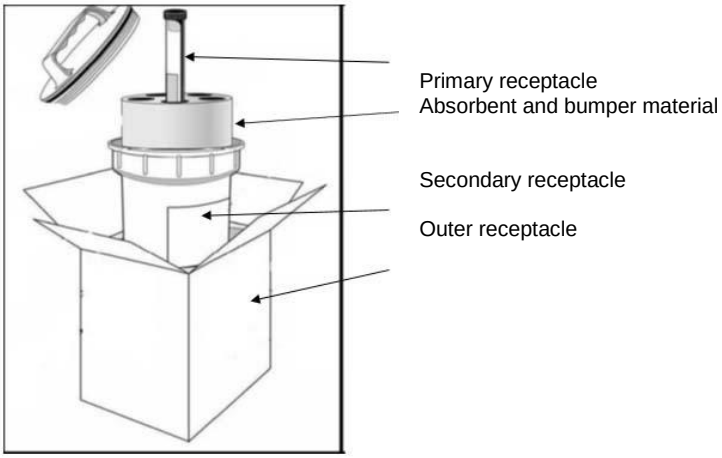
Tracheal aspirate or bronchoscopic samples should be preferred for samples to be taken from the lower respiratory tract. A nasopharyngeal wash sample or a nasal and / or oropharyngeal swab should be sent together in cases where the sample cannot be collected from the lower respiratory tract or in cases without lower respiratory symptoms. Ideally, 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 medium.**

Respiratory samples from probable and confirmed COVID-19 patients should be taken by healthcare workers appointed, who should have been informed about infection control measures, use of personal protective equipment by the Infection Control Nurses and about sampling methods by Infection Control Doctor.

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 in individuals conforming to the definition of probable case and those whose **infection findings continue becoming more severe.**

5.2. 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 generates aerosol, 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. (Double transport system will be sufficient for in-hospital dispatches).
- 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 in absolute terms.
- The Regulation on the Control of Medical Wastes should apply to sample wastes.



Triple receptacle

5.3. 5.3Information required to be recorded:

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

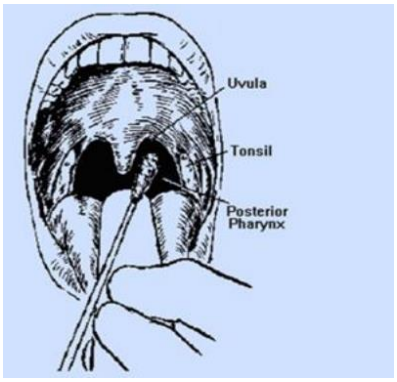


Figure 4: Collection of throat swab (https://hsgm.saglik.gov.tr/depo/kurumsal/plan-ve-faaliyetler/numune-alma-el-kitabi.pdf)

Figure 5: Collection of nasal swab (https://hsgm.saglik.gov.tr/depo/kurumsal/plan-ve-faaliyetler/numune-alma-el-kitabi.pdf)

XIII. USE OF THORACIC COMPUTED TOMOGRAPHY ON COVID-19 PATIENTS

Thoracic computed tomography (CT) is a sensitive diagnostic approach for PCR test negative COVID-19 patients in the early period. Thoracic CT is recommended to support faster triage of such patients.
CT imaging is not recommended for patients who are COVID-19 positive with mild symptoms yet do not pose risk factors as to progress of disease and those patients who are COVID-19 negative with mild symptoms.

CT must be carefully interpreted to avoid overlooking other pathologies that may explain such symptoms in patients whose CT symptoms are non-diagnostic for COVID-19 infection and do not suggest COVID-19 in the foreground in clinical and laboratory symptoms. It would be useful to consider Table X in reporting for the sake of objectivity in patient triage during pandemic, both as to avoid overlooking probable COVID-19 infection and to allow alternative diagnoses.

Table X.

Classification	Reason	CT Symptom	Suggested format of reporting
Typical	Imaging symptoms frequently reported for COVID-19 pneumonia	• Peripheral, bilateral (multilobe) GGO* (may be associated with consolidation and cobblestone pattern) • Multifocal round GGO (may be associated with consolidation and cobblestone pattern) • Reverse halo or other symptoms of organized pneumonia	There are imaging symptoms of COVID-19 reported frequently yet influenza pneumonia and organized pneumonia may create similar appearances.
Unclear	Nonspecific imaging symptoms for COVID-19 pneumonia	Absence of typical symptom and presence of the following: • Round and non-peripheric multifocal, diffuse, perihilar or unilateral GGO (+/- consolidation) • Round and non-peripheric, limited number of small GGO	Symptoms may be seen in COVID-19 pneumonia however they are nonspecific and may be monitored in an array of infections and non-infectious diseases.
Atypical	Symptoms rarely reported or not previously reported for COVID-19 pneumonia	Absence of typical or unclear symptoms and presence of the following: • Lobar or segmental consolidation with no GGO • Scattered small nodules (tree-in-bud pattern) • Cavitation • Pleural effusion accompanied by interlobular septal thickening **	Imaging symptoms are atypical for COVID-19 pneumonia. Alternative diagnoses should be taken into consideration.
Negative	No pneumonia symptoms available	• No CT symptoms to suggest pneumonia	No CT symptom in favor of pneumonia (CT may be

			negative in the early stages of COVID-19).

*GGO: Ground glass opacities

** Septal thickening outside ground glass sections is an atypical feature. However, in accompany with pleural effusion, this might suggest other pathologies such as heart failure. Pleural effusion is a rare symptom in COVID-19 pneumonia severe cases.

In deteriorated clinical pictures, CT imaging is recommended to evaluate COVID-19 progression or secondary cardiopulmonary anomalies such as pulmonary emboli or added bacterial pneumonia or heart failure secondary to probable COVID-19 myocarditis damage.

Nevertheless, routine use of CT is not recommended in evaluating the response to treatment throughout monitoring period. Clinical and laboratory parameters are more sensitive. However, in cases where additional pathologies such as acute pulmonary thromboembolism that may have an influence on therapy decision are suspected -and if renal failure is not accompanied – contrast enhanced CT may be required. Patients who develop functional disorders after recovering from COVID-19 should undergo imaging in order to differentiate morphologic anomalies expected as sequelae of infection or mechanic ventilation and different and potentially treatable process.