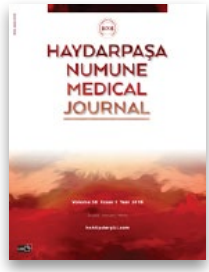
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REVIEW

Configuration of the Anesthesia Clinic in the COVID-19 Pandemic: Dokuz Eylül Faculty of Medicine Anesthesiology and Reanimation Department

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Abstract

As in the whole world, when the first case detection in the pandemic emerged in our country on March 11, 2020, as anesthesiologists and Dokuz Eylul University Faculty of Medicine Anesthesiology and Reanimation Department Faculty Members, we took the necessary precautions in the operation of the operating theatre and intensive care units. Subsequently, it was aimed to prepare a guideline on how to behave in patients whose operation is mandatory in the light of the available data, which can be applied during the pandemic, aiming to protect both patient safety and working healthcare professionals.

Keywords: Anesthesiology; COVID-19; SARS-CoV-2; intensive care unit

The Novel *Coronavirus* (COVID-19) is a virus that was first identified in China's Wuhan Province in late December, 2019 with respiratory symptoms (fever, cough, shortness of breath) as a result of research in a group of patients [1].

The pandemic was initially detected in the sea animals and other living beingsin the animal market in this region. Later, it spread from person to person and spread to other cities, especially Wuhan, and countries. While many subtypes of *Coronaviruses* mostly caused colds in humans until today, a new type of coronavirus was detected in Wuhan, city of Hubei province of China on December 31, 2019, and the name of the disease was defined as COVID-19. *Coronaviruses* are a large family of viruses that can cause illness in animals or humans. In humans, several *coronaviruses* are known to cause respiratory infections, ranging from the common cold to more severe diseases such as "Middle East Respiratory Syndrome" *(MERS)* and "Severe Acute Respiratory Syndrome" *(SARS)*.

When the first case detection officially emerged in our country on March 11, 2020, we held our first meeting as Faculty Members of Dokuz Eylul University Faculty of Medicine, Department of Anesthesiology and Reanimation. As a result of this meeting, it was decided to reduce elective surgical procedures and a responsible team was formed including a faculty member responsible of the operating theatre, an anesthesia technician, an anesthesia resident, a nurse and anesthesia faculty members, and their task distribution and daily operating theatre /intensive care unit oper-

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ations were planned. Anesthesia Department outpatient clinic was evaluated as a whole with Algology Department and Intensive Care Department. Care was taken to ensure that planning and equipment organizations were feasible for the whole team.

In the first evaluation, it was planned to stop the elective operations related to the operation of the operating theatre. While 4 residents had been assigned in routine practice for the outpatient clinic service, the number was reduced to 1 and it was planned that the same person would also take care of the patients of the Algology Department. A working plan of residents, experts and faculty members was established in order to prevent unnecessary crowds of people and to ensure physical distance quickly. The plan created was presented to the senior management and started to be implemented after approval.

The code blue team was defined as the team with the highest risk of contamination during emergency intubation in pandemic wards [3]. The Hospital's Pandemic Management Team requested that an intubation team be formed outside of the code blue team when the intubation and ventilation needs of COVID-19 patients arose. This team consisted of the senior anesthesia resident and anesthesia technician of that day's shift. It was announced that the teams and residents should not wear accessories (rings, bracelets, necklaces, keys, etc.) during working hours, and should not use accessories such as scarves and belts as much as possible. At the same time, *videolaryngoscope* to be used for intubation in the operating theatre, and *protective intubation box* (Fig. 1) to protect healthcare workers during intubation were urgently requested. In the first place, 7 videolaryngoscopes were purchased by the hospital management (Fig. 2). The distribution of these laryngoscopes was made as to be present in the operating theatre, blue code bag, pandemic service and pandemic emergency service. In the first applications, elective intubations have been performed in the pandemic ward. Later, intubation of the patient in the pandemic ward and transport of the intubated patient to the intensive care unit by ventilation were found to be risky. If intubation is elective and time is sufficient, it has been decided that the patient will be transported to the intensive care unit under appropriate conditions, and the intubation team will intubate the patient and deliver the patient to the intensive care team. It was deemed appropriate to carry out such an application so that the intensive care physicians would not hinder their patient follow-up. Training materials were prepared for preoperative evaluation, perioperative and postoperative procedures in the COVID-19 operating theatre and operating theatres where elective cases have been taken. In patient preparation for all elective surgeries, if the patient was diagnosed with COVID-19 or suspected, it was decided to cancel or postpone the surgeries. An operating theatre has been prepared for emergency surgeries for those diagnosed with COVID -19. While most of the hospitals were fighting against COVID-19, it has not been ignored that routine life continues. Considering this issue, most healthcare professionals in



Figure 1. Protective intubation box.



Figure 2. Prepared intubation team member with videolaryngoscope and PPE.

our country made an emergency case selection and planned surgeries (cancer surgery, cesarean section, pediatric emergencies, trauma, etc.) by taking the necessary protective measures. During the pre-anesthesia evaluation, apart from the routine physical and laboratory evaluation of the patients, the entire team was informed that it is necessary to make inquiries such as suspicious contact, sore throat, dry cough, myalgia, fever in the last 14 days and write them in the anesthesia form completely. In suspected cases, chest X-ray or chest tomography was requested from the patients who were planned for surgery. If examinations that require close contact, such as airway evaluation and assessment of Mallampati score, were mandatory during the pre-anesthesia evaluation, Personal Protective Equipment (PPE), N95 masks and a visor should have been used. The issue of where pre-anesthetic evaluations should be made in emergency cases diagnosed with COVID-19 (operating theatre, service, emergency room, or intensive care) is controversial. Therefore, we decided to act according to emergency and elective situations in these cases.

In our hospital, as in our whole country, with the onset of the COVID-19 pandemic, it was decided to add modifications in the anesthesia consents to inform the patient. The patient information attached to the anesthesia consents can be seen in Picture 3. In the briefing, the patient or their relatives were informed by reading the letter, "*I am aware that the Hospital I will be in during the anesthesia applications to be made is a Pandemic Hospital, that all necessary national/international measures are taken to reduce the risk of transmission with the SARS-COV-2 virus in the hospital, and I accept that I may be at risk of disease transmission.*", and the consent was obtained. Before transferring to the operating theatre, the surgical units were informed about the final temperature control. It was decided that all patients would be transferred to the operating theatre with face masks.

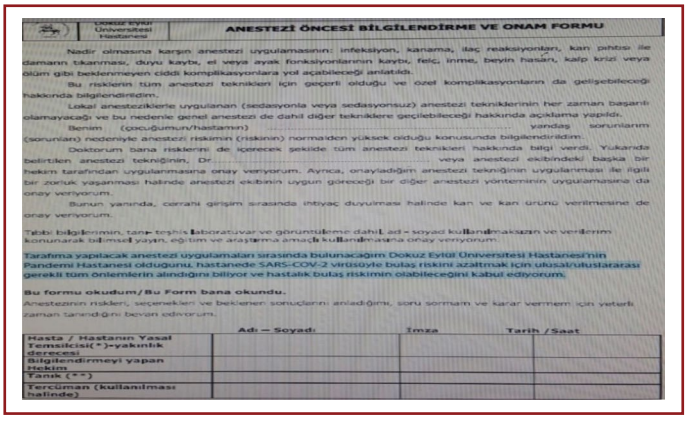

ANESTEZİ ÖNCESİ BİLGİLENDİRME VE ONAM FORMU

Figure 3. Anesthesia Information and Consent Form.

How was the COVID-19 Operating Theatre Prepared?

It is aimed to provide negative pressure as recommended in the operating theatre where COVID-19 (+) cases were planned to be taken, but considering the situation that this application cannot be performed in every hospital, it is aimed to reduce the positive pressure to the lowest possible level and to keep the hall doors completely closed.

If available, a negative pressure operating theatre should be constructed. In a negative pressure operating theatre, there should be a 5 *kPa* difference between the operating theatre and the clean room. Table 1 shows the characteristics of operating theatre environments with negative pressure, positive pressure and those in routine use [4].

If the operating theatre with negative pressure cannot be prepared, but there is a negative pressure room near the operating theatre, the patient's intubation can be performed in this room and transport can be considered.

Before the patient is taken to the operating theatre, intravenous accesses, drugs, instruments to be used (including monitors, ventilator and closed-circuit aspiration system) should be checked, and medication preparation should not be done in the room. Care should be taken that there are no extra materials in the theatres. After checking that the preparation of the room is complete, the task planning should be done. Care should be taken that there are not more people than necessary in the operating theatre. The entrances and exits of the patient should be determined in advance and warning signs should be hung there, the

Table 1. Negative pressure, positive pressure and routine operating room environments

Variable	Negative Pressure	Positive Pressure	Operating Theatre
In-room pressure	Negative	Positive	Positive
Air change (/hour)	>12	>12	>15
Direction of airflow	From clean to dirty (the patient is on the dirty side)	From clean to dirty (the patient is on the clean side)	From clean to dirty (the patient is on the clean side)
Filtration	90%	99.97%	90%
Recirculation	–	+	+

presence of disinfectant to ensure hand hygiene after each intervention and the waste system should be prepared in advance. In the preparation of the operating theatre, the top of the anesthesia device and the monitor should be covered with transparent nylon bag so that the controls and the screen are visible. While performing these operations, it should be ensured that the adjustable pressure-limiting (APL) valve is covered in a wider way so that there is no tearing on the cover during opening and closing. After the preparation of the room and team, the patient should be taken directly to the operating table and the above-mentioned steps should be followed for intubation. All material should be covered with protective transparent nylon bag (videolaryngoscope, USG, etc.). Materials that will not be used in the operating theatre should be taken out beforehand. A lidded tray should be prepared in advance to sterilize the videolaryngoscope, after its use is finished. Likewise, waste management should be planned after the patient is removed from the hall after extubation and recovery (anesthesia machine, transparent nylon covers on the videolaryngoscope, gowns, gloves, etc.). It should be planned where the materials will be disposed of, how and where materials such as glasses and visors will be disinfected. If possible, these disinfection processes should be done in the dirty area close to the theatre. All these applications have been prepared in our department within a few days with team consciousness.

The application of PPE mentioned above is important both for the self-protection of the healthcare worker and to avoid social transmission and spread.

Personal Protective Equipment: These are barriers used individually or in combination to prevent mucosa, skin and clothing from coming into contact with infectious agents. The materials included in this scope are listed below.

Surgical mask, N95 or FFP2/FFP3 mask, protective gown, goggles, face shield, gloves, shoe covers, bonnet

Proper Use of Protective Equipment [5,6]

Hand hygiene is required before using PPE.

1. Gown
- Wear the gown to cover the torso from neck to knees, and sleeves all the way to the ankles and wrap from the back.
- Tie at the back of the neck and waist.
2. Surgical mask or N95 / FFP2 Mask
- Tie ropes or elastics in the middle of the head and neck.
- Snap the elastic band on the bridge of the nose.
3. Goggles or face shield

Place over face and eyes and adjust for a snug fit.

4. Gloves
- Dress to cover the wrists of the isolation gown.

Sequence for donning; Gown– Mask – Goggles-face shield – Gloves

Sequence for doffing; Gloves – Goggles-face shield– Gown – Mask

Safe Removal of Personal Protective Equipment

Remove all worn PPE before leaving the patient room, except for the surgical mask / N95 / FFP2 mask. After leaving the patient room and closing the door, the surgical mask / N95 / FFP2 mask must be removed.

Gloves

The outside of the gloves is ***contaminated!***

- If your hands become contaminated while removing gloves, wash them immediately or use an alcohol-based handrub.
- Using the gloved hand, grasp the palm of the other gloved hand and remove the glove.
- With your gloved hand, hold the glove you removed from your other hand.
- Put your fingers on the wrist of your gloved hand and remove the glove on top of the first glove you removed.
- Dispose of gloves in a closed medical waste bin.

Glasses, Shield

The outside of the goggles or face shield is ***contaminated!***

- If your hands become contaminated while removing the goggles or face shield, wash your hands immediately or use an alcohol-based handrub.
- Lift the goggles or face shield upwards by holding the headband or earpieces from the back.
- If it is reusable, put it in a housing set for processing. If not, dispose of it in a closed medical waste bin.

Gown, Coveralls

The front and sleeves of the gown are ***contaminated!***

- If your hands become contaminated while removing the gown, wash your hands immediately or use an alcohol-based handrub.
- Untie the gown's strings, being careful not to let your arms touch your body while reaching for the strings.
- Pull from neck and shoulders by simply touching the inside of the gown.
- Turn the inside of the gown out.
- Wrap up and dispose of in a closed medical waste bin.

Mask

The front of the surgical Mask / N95 / FFP2 is ***contaminated – do not touch!***

- If your hands become contaminated while removing the surgical mask / N95 / FFP2 mask, wash your hands immediately or use an alcohol-based handrub.
- Grasp the middle strings or elastics of the surgical mask / N95 / FFP2 mask, then grab the upper ones and remove them without touching the front.
- Dispose in a closed medical waste bin.

Wash Hands or Use Alcohol-Based Handrub After Removing All PPE!

» Keep your hands away from your face.

» Limit touched surfaces.

» Change gloves when torn or heavily contaminated.

» Provide hand hygiene.

It is appropriate to follow the recommendations below in the practice of anesthesia during COVID-19 pandemic, in aerosol-generating interventions, especially in interventions such as intubation:

1. Above all, personal protection is the most important step. As it will take time, personal protection equipment and their applications should be planned in advance. Donning and doffing of PPE should be learned before proceeding with intubation. It should be noted that most healthcare worker contamination occurs during PPE removal.
2. Hand hygiene is required before and after all interventions.
3. Appropriate N95 (FFP2), shield, goggles and gloves (double coat), coveralls and gown should be worn**
4. The number of personnel entering the room where intubation will be performed should be kept to a minimum and this should be planned in advance.
5. Intubation should be performed by the most experienced anesthetist available. It should be noted that as the number of intubation attempts increases, the amount of aerosol will also increase.
6. Intravenous accesses, drugs, instruments to be used (including monitors, ventilators and aspirators) should be checked.
7. Awake fiberoptic intubation should be avoided. Application of atomised local anesthetic may increase aerosol formation. A videolaryngoscope should be used. *Supraglottic* airway devices and mask ventilation are not recommended for patients undergoing general anesthesia.
8. Protective intubation boxes can be used to protect healthcare workers from aerosol formation. This box should remain in place until the patient is extubated after the procedure (Fig. 1).
9. Rapid sequence induction (RSI) and cricoid pressure by a qualified staff are recommended. RSI should be modified if the patient has a high alveolar-arterial gradient and cannot tolerate apnea for 30 seconds, or if a neuromuscular blocker is contraindicated. If it is necessary to manually ventilate the patient, low-tidal-volume ventilation should be implemented.
10. The patient should be preoxygenated with 100% oxygen for 5 minutes and with the RSI, it should be ensured that manual ventilation of the patient is not required (ventilation will cause potential aerosalization).
11. It is also recommended that filters be placed between the patient's face mask and ventilator hoses, between the expiratory valve, and on the inspiratory outlet on some machines. "*End tidal*" CO_2 line (gas sampling line) (other gases and O_2 are also measured from this line) must be placed close to the machine after the filters, and that line must be protected (Gas sampling line must be installed close to the machine, after the filters, for better protection). In the balloon valve system ***(which should not be used unless necessary)***, a filter should be placed between the patient and the extension piece, as well as between the balloon and the extension piece (Fig. 4a-b).

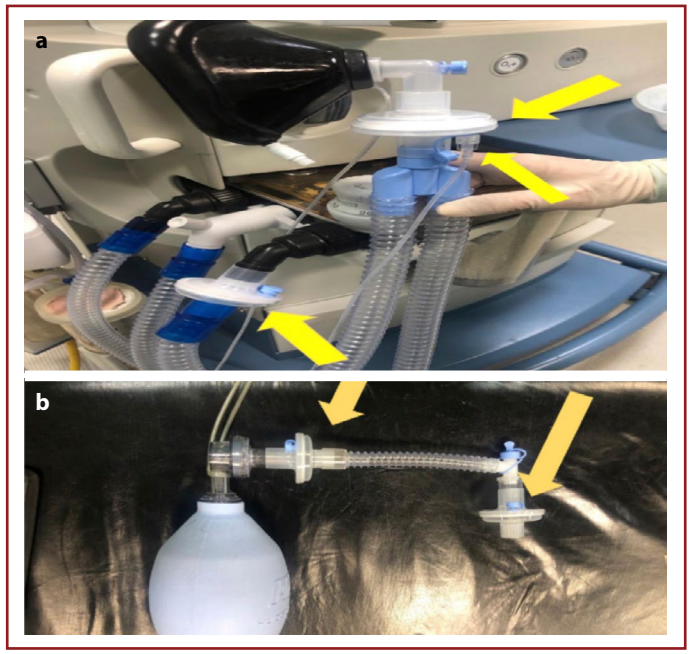


Figure 4. (a) Anesthesia device filter and gas sampling line placement. **(b)** Filter placement in the balloon valve system.

Care should be taken to ensure that the reservoir is installed in the balloon valve system.

12. Tracheal intubation tube should be closed with a clamp as seen in Figure 5.
13. After intubation, the cuff should be inflated immediately and the breathing circuit should be connected and the clamp should be opened.
14. After intubating the patient and ensuring airway safety, one of the double-layered gloves should be removed and thrown into the closed medical waste bin. A second layer of gloves should be worn after hand disinfection.

Extubation:

1. Since the patient is likely to cough during extubation, a protective intubation box can be used to protect healthcare workers from aerosol formation. In cases where these boxes are not available, the transparent covers in Figure 6 can be used.
2. Closed suction systems are recommended for the aspiration process.
3. Before starting the extubation procedure, after checking the nasal oxygen cannula and the surgical mask that you will use after extubation, the heat and moisture exchanger (HME) filter between the ventilator circuit and the endotracheal tube should be separated so that the patient will have the filter at the end of the intubation tube. The other filter must be connected to the mask. By bringing the mask closer to the patient, the cuff of the endotracheal tube is deflated and withdrawn. The patient's breathing and tidal volume are controlled by the mask-connected circuit.
4. A nasal oxygen cannula is attached to the patient with adequate tidal volume inhalation and sufficient respiratory rate, and a surgical mask is put on. It should be ensured that the patient fully recovered. The patient with a *Modified Aldrete Score* of 9-10 is sent to the related service with a nasal cannula on oxygen support, a surgical face mask on, and a transfer oxygen tube. Educational slides and documents on these subjects were quickly prepared by the teams established in our department and shared with all faculty members, residents and anesthesia technicians.

The Code Blue team (and/or private intubation team) must also comply with all PPE usage guidelines. They should also be informed about the recently published CPR algorithm. The CPR algorithm is shown in Figure 7 [7].

The videolaryngoscope is placed in the CIDEX™ (glutaraldehyde) disinfectant solution in the infected section of the



Figure 5. Endotracheal tube clamp.

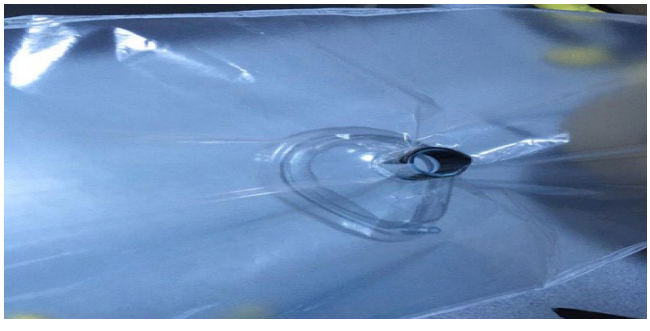


Figure 6. Transparent nylon cover and mask.

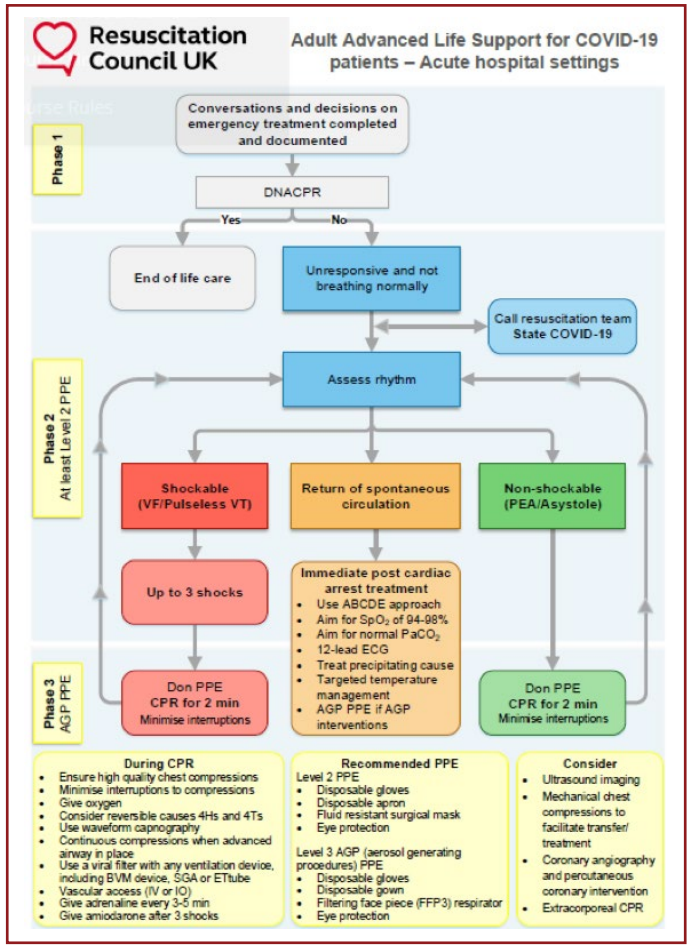


Figure 7. CPR algorithm prepared by the Resuscitation Council [7].

room and left for 20 minutes.

After the patient leaves the operating theatre, disinfection should be performed in the operating room. For this purpose, in addition to this process, we use UV lamps to reduce viral load. Cleaning of the operating theatre includes closing the doors of the theatre and treating with UV for 30 minutes in accordance with the instructions for use, and waiting for 10 minutes, then removing the infected nylons and wiping the surfaces with disinfectant, and then putting on new nylon protective covers.

Making additions to consents

In addition to the patient's consent to the operation in a pandemic hospital, it would be appropriate to inform the patients about the fact that, although they are asymptomatic, as shown by some studies, their clinical condition may worsen after the surgical procedure. Many factors should be considered during the pandemic period. While patients may be asymptomatic carriers, Lei et al. [8] stated that the patient may still be in the incubation period and transmission may even happen from an infected surgeon. At the same time, many factors such as the anesthesia method applied to the patient during the surgery and the duration of hospitalization should be considered.

In addition, in terms of elective operations during the pandemic period, the following questions should be legally answered:

1. Can elective surgical procedures be performed in a pandemic hospital?
2. Do these additions protect us if any problem occurs in the future?
3. Can a patient be admitted to a pandemic hospital, except for COVID-19?

Below are the answers from some lawyers. In the light of these, it is necessary to decide how to proceed and put it into practice as soon as possible.

Lawyer 1; "This statement is an example of an agreement of unresponsibility. It has no legal binding. Çünkü sağlık hizmetinde sonuç garantisi olmadığı gibi, zaten alınması gereken her türlü tedbir alınmak zorundadır. This statement can only be evaluated within the scope of risk clarification, that a pandemic has already been declared in our country. It is assumed that the average individual would know this. As a result, it is not legally binding, but it can be useful in the context of information, a reminder."

Lawyer 2; "There is no published circular to ban performing elective cases to pandemic hospitals. Moreover, the Ministry of Health did not impose a restriction on the diagnosis, treatment and follow-up of only COVID-19 patients in pandemic hospitals. In this case, if the cases mentioned in the question later suffer from COVID-19, they can file a lawsuit against the administration for compensation. However, for the reasons I have listed, since such a situation will arise from the organizational fault of the administration, even if a compensation is paid, even if the administration files a recourse lawsuit against its personnel (which it certainly does), it cannot receive the compensation paid by recourse from its personnel due to its own fault. However, such an addition to the consent form is necessary and sufficient within the framework of the physician's obligation to inform."

Every country should have their own pandemic plan. Education should be done.

This pandemic has shown us that countries should have a plan in advance for a possible pandemic. Within this plan, algorithms should be prepared considering the worst possible scenarios, different opinions should be taken for the plans, and the applicability of these algorithms should be measured. It should become mandatory in all training seminars and in lessions at medical faculties, including the topics of who will provide staff training and where.

Pandemic preparedness is not a quick process.

The aim is to inform society, institutions and organizations across the country about the pandemic and to provide the information and framework that will help them to be prepared according to their roles and responsibilities in the plan.

Command and control: All health institutions will meet the increased number of patients during the pandemic, and will make arrangements to continue services without interruption in case of illness of health personnel. For this purpose, a checklist should be prepared. Existing laws are sufficient to implement all kinds of public health protective practices (quarantine, school closure, cancellation of meetings, travel ban) during the pandemic.

Monitoring the pandemic: In the pre-pandemic period, *surveillance* is carried out to determine the virus type and vaccine effectiveness in the community. Disease monitoring during the pandemic will be aimed at monitoring the number of cases and mortality rates. A regular flow of information will be provided from all health institutions. Authorized laboratories will be determined for the diagnosis of the disease, necessary forms will be prepared for case definition, and treatment protocols will be determined for patients. What should be done for infection control of health institutions should be determined. Protective equipment

standards of health personnel will be determined and the stocks of the Ministry of Health will be increased. Monitoring, diagnosis and treatment services of employees will be organized so that communication, energy and transportation security services are not disrupted.

New plans will be made by evaluating the data and applications obtained during the pandemic. Scientific research support will be provided. Socioeconomic consequences of the pandemic will be evaluated.

Pandemic Plan in Health Institutions

Checklist

- Selecting the notification manager
- Preparation of an emergency plan
- Communication plan with the Provincial Health Directorate
- Extracting personnel information, determining the necessary personnel needs
- Determination of medical equipment and drug stock information
- The patient load of the health institution and obtaining the geographical and demographic information of the region it is responsible for
- Information of institutions in the region where the health institution is responsible (school, dormitory)
- Basic in-service training of health personnel about influenza
- Determining the *surveillance* officer and controlling his/her functioning
- Training of personnel who will notice the epidemic
- Translating internal communication and emergency applications into written text in case of an pandemic
- Planning and supply of personal protective equipment kit
- Determination of the amount of vaccine and medicine required for the personnel of the institution
- Stocking of antiviral drugs to be used in patients
- Conducting an "emergency drill"
- Conducting "internal and external communication exercises"
- Planning leaves of health personnel

If the pandemic is on alert level;

- Sending a "Pandemic Preparedness Checklist" to all public and private institutions providing health services, sending an "Infrastructure Checklist", determining the current situation in terms of infrastructure and providing a standard
- Establishment of the National Pandemic Monitoring Board
- Identifying and correcting legal gaps in the organization of services

The pandemic regulations mentioned above were prepared as a result of a meeting, carried out on 11-12 July 2005, with broad participation of the representatives of the Ministry of Health and the Ministry of Agriculture and Rural Affairs, experts from the Ministry of Health Training and Research Hospitals and Universities' Public Health, Infectious Diseases and Clinical Microbiology, Clinical Microbiology, Chest Diseases Clinics, and the representatives of companies that import vaccines and antiviral drugs. The plan can be accessed from the flu and bird flu section on www.saglik.gov.tr [9].

Intensive Care Units Action Plan [10]

The intensive care action plan (March 18, 2020) was designed to prepare intensive care units and healthcare personnel working in the intensive care unit for situations that may be complicated by material shortages, supply chain problems, workforce planning difficulties and the expected increase in patients due to COVID-19 and limited ICU for all patients, and was designed to minimize the burden on limited intensive care unit capacity for all patients and to protect the health and sustainability of the intensive care unit workforce.

We have prepared this plan according to a phased and gradual response based on the impact of the pandemic on the capacity of the intensive care unit to meet the needs associated with daily activity. In this phased and gradual plan, we have written our strategies and solutions according to the occupancy rates of intensive care beds. In this plan, we briefly defined what needs to be done to reduce routine intensive care unit demand, physical intensive care unit bed space capacity throughout the hospital, and outlined plans to increase it, as well as related equipment and workforce requirements.

First of all, the intensive care unit, surgery, anesthesia and nursing services jointly decided and notified the chief physician in order to reduce the demand for intensive care services and to create an appropriate process by considering the postponement or cancellation of non-emergency surgical operations. If it was decided to perform elective surgery, the operating conditions of the intensive care unit were also taken into account and a shared decision-making model was used.

Regarding the admission to the intensive care unit of patients who need to be hospitalized in the intensive care unit and who do not have COVID-19, priority was given to the intensive care admission of the patients who needed mechanical ventilation. It was ensured that patients who needed only monitoring were treated and cared for in their own wards. As a result, it was possible to shorten the length of stay of patients in the emergency room or in resuscitation, to admit patients to specialized areas that can easily monitor patients, and to manage patients in the wards, who needed Level II intensive care unit admission.

In order to prevent the need for an intensive care unit in patients who received treatment and care services in the wards, it was ensured that the patients were evaluated proactively every day and followed up by setting early treatment targets. Efforts were made to ensure that all of these measures take effect before demand for intensive care exceeds capacity.

Secondly, the physical intensive care unit areas (Infrastructure) were reviewed and the "ICU Triage Area" was created in order to increase the intensive care capacity in our hospital. For these areas, it is planned that the patients hospitalized in the Anesthesia Intensive Care (AIC) and Internal Medicine Intensive Care (MCIC) units will be discharged quickly, and the remaining patients will be admitted to the Cardiovascular Surgery intensive care unit. Thus, the AIC unit was changed into triage ICU for suspected COVID-19 patients. Due to the increase in the number of patients, it was decided that those who needed intensive care should be admitted to the Internal Medicine Intensive Care (IMIC) Unit first, and if the IMIC unit bed was insufficient, to the empty beds in other intensive care services. Thus, in the first place, specialized intensive care service was provided to patients who were diagnosed with COVID-19 and needed intensive care. After a total of 20 beds in the AIC unit were filled, the beds in the MCIC service were put into use. When the IMIC and AIC beds (41 beds in total) were full, it was planned to hospitalize patients in the Neurology Stroke unit, Cardiology intensive care unit, and finally the post-anesthesia care unit (PACU) service, respectively.

In addition, all clinical areas with physical infrastructure suitable for the care of intensive care patients were determined. These were determined as rooms that previously served as intensive care rooms, perioperative monitoring/recovery areas, activation of unused areas in intensive care, and out-of-service intensive care areas. The criteria for determining these areas were to include at least two oxygen outlets, one air outlet, two aspiration outlets, at least twelve electrical outlets, and a monitor. Processes have been developed to enable rapid reuse of these areas, and workforce models have been planned that potentially enable ICU personnel to work in different physical locations.

The necessary but missing materials for the follow-up and treatment of the cases in the intensive care unit were completed quickly.

The processes necessary for the discharge of patients who do not need mechanical ventilation support from the intensive care unit and their rapid transfer to the specialized services for COVID-19 (Pandemic service) were determined and implemented.

Considering that due to the potential workforce shortage, trained doctors, nurses and allied health personnel with no intensive care experience will need to assist in the treatment and care of intensive care patients, nurses and staff who have worked in the intensive care unit before and who are familiar with the intensive care environment were determined and their shift was planned. Intensive care units and hospitals should prioritize meeting the minimum standards for staff according to the Ministry of Health Intensive Care regulation. Pandemic-specific requirements of workforce planning and the need to allocate staff to non-clinical tasks were considered, such as the additional workload of donning and doffing personal protective equipment (PPE), the need for additional rest days and infection prevention.

In case of need for additional medical personnel in the intensive care unit, senior healthcare personnel and anesthesiologists who received intensive care training but did not work in the ICU were determined.

In order to provide a sustainable workforce, the accommodation problem for the personnel who could not return home was tried to be resolved by meeting with the chief physician. With sharing information and psychological support, it was tried to minimize the negative impact on the staff due to the increased workload, personal safety concerns and the health of family members.

"COVID-19 ICU Communication Network" was established throughout the hospital, active communication was ensured, daily new cases, discharge and death numbers, demographic data, disease severity data and ICU bed status were followed through this network. Intensive care load and capacity were measured in real time and conveyed to the relevant in-hospital administrative authorities.

Controlling exposure to COVID-19 is the primary method of protecting healthcare workers in order to provide a safe working environment in intensive care – ensuring staff protection and sustainability. For this reason, doctor work

shifts were applied in 12-hour intervals, while nurse work shifts were applied in 8-hour intervals.

Engineering checks were made. Intensive care ventilation was set to be 6 times per hour.

A record of personnel training on the compatibility and adequacy of personal protective equipment use of intensive care workers was kept, and it was ensured that the entire intensive care team received training on the use of personal protective equipment. Every breach observed in the use of personal protective equipment should be recorded as an occupational health and safety risk in the incident management system. An assessment of the breach was made, with a control assessment by an infectious disease physician as to whether the breach required a period of self-isolation.

Considering the stress of the person in the intensive care unit, patient visits were restricted and closed to visitors, with emphasis on the protection of patients, families and staff. Relatives of patients were informed about their patients by phone calls.

Due to the higher viral load and aerosol-generating procedures in the ICU due to the nature of critical illness, and the increased risk of spreading the virus by aerosol, the use of personal protective equipment measures against airborne transmission is recommended for the care of all COVID-19 patients in the ICU. In addition, aerosol generating procedures have been minimised.

All intensive care personnel (doctors, nurses, allied health personnel, cleaning staff and on-duty assistants) were provided with training on infection control and personal protection equipment. While caring for a confirmed or suspected COVID-19 patient in our ICU, all donning and doffing procedures were overseen by an additional suitably trained staff member.

For staff care and well-being, clean scrubs that can be changed before each shift and shower places were arranged for them to take a shower at the end of each shift. In addition, food and beverages were provided for ICU staff, staff body temperature measurements were checked and reported at the beginning and end of each shift.

Staff were warned to use secure and approved platforms, such as corporate email and messaging apps, for staff information and training, inter-departmental communication, hospitals and ICUs to receive information about any changes in policy, workflow or other relevant information.

The COVID-19 pandemic has shown us that anesthesia and intensive care physicians have serious responsibilities. Our rapid re-organization as anesthesia department has given us the opportunity to respond to the increasing number of cases these days. The important point is to discuss what changes we will make in our anesthesia practices during and after this pandemic. After this pandemic, as in everything else, healthcare will be evaluated before and after the COVID-19 outbreak. These will require a redesigning of some things in the structure of health institutions, hospitals, as well as in human behavior, medical approaches, precautions and drugs and treatment methods. In such highly contagious pandemics, the departments in the hospitals should be designed in such a way that they can be used completely separately from each other (to completely separate the clean area from the dirty area) when needed. After the pandemic, it is important to make changes in the existing hospitals and to draw the plans of the new hospitals to be built accordingly.

For example, operating theatres, delivery rooms, shift rooms (in terms of having separate places for teams to sit, rest, eat, and sleep, such as anesthesia), corridors, elevators, polyclinics, hospital entrances and exits and many other places will need to be built in sucha design that it can be changed immediately in case of a pandemic.

In addition, sterilization units are the places that work the most in case of a pandemic. The spare capacity of these units should always be ready. Access to sterilization units, increasing clean and dirty material transport facilities are important in terms of maintaining hospital working order. The use cycle of hospital gowns is accelerated significantly. Both quantity and laundry facilities should be at a level to keep up with the pandemic situation.

It may also be necessary to make changes in the structures of the ventilation systems of hospitals. For example, the places where the systems take the air to pump air into the hospital and the places where they pump the polluted air from inside the hospital to the outside of the hospital should be very far from each other so that they are not affected.

The need for materials such as filters, water traps, gas sampling lines of anesthesia devices is increasing. Institutions should be prepared for these situations. In our department, spares for all ventilator systems (valves and ventilator parts), which are their own parts, were purchased, except for the breathing hoses. These ventilator systems were fully replaceable in a very short time, kept in sterile packaging and used to have clean devices for use again following septic cases. These spare ventilator system and parts, which can be changed very easily and in a short time, ensured that our anesthesia devices used in COVID-19 positive or highly

suspected cases were ready for use again very quickly, during this pandemic.

After this pandemic, will we take COVID-19 precautions for every patient we will take into surgery? How often will teams be screened for COVID-19? How will we manage ethical issues, insurance payments, etc.? We think that there will be serious problems waiting for anesthetists. Our recommendation is to establish a national anesthesia network urgently in this regard, to discuss the experiences with anesthesia societies and to take urgent measures.

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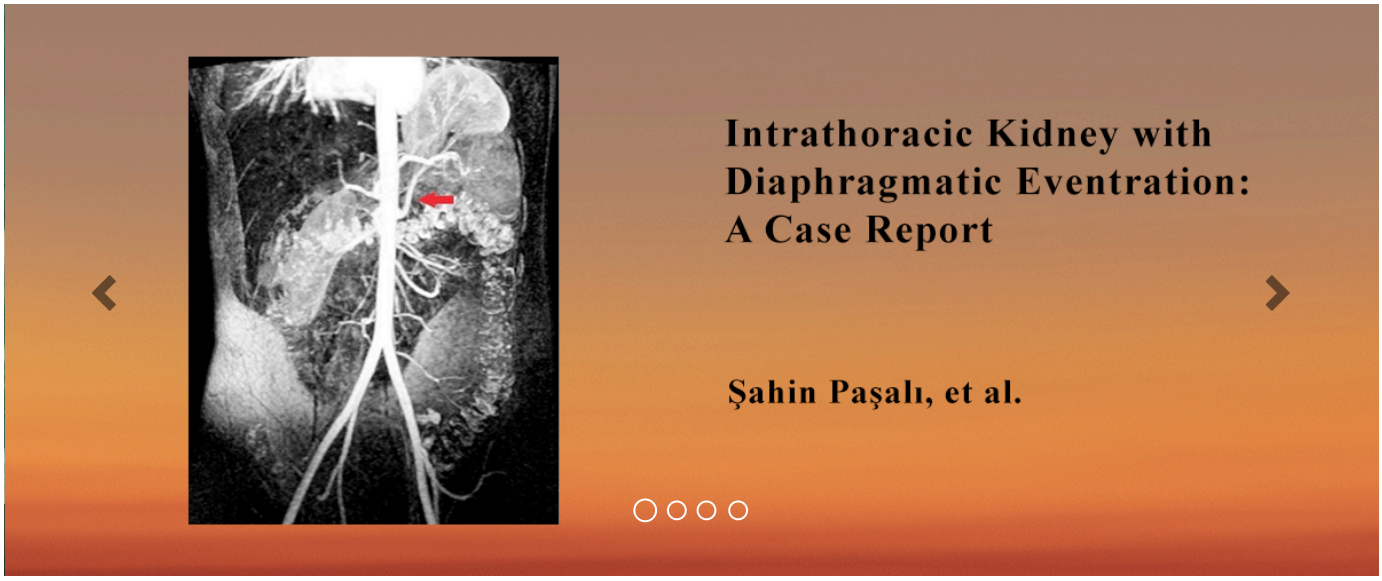


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