



# AMERICAN JOURNAL OF PHARMTECH RESEARCH

Journal home page: <http://www.ajptr.com/>

## Management of COVID-19 Suspected Patients in Critical Care Unit: An Overview Recommendations

Safa Bakr\*

*Anesthesia department, Technical college of Health, Sulaimani Polytechnic University.*

### ABSTRACT

COVID 2019 is a sever respiratory disease caused by a type of Coronavirus called SARS – CoV-2, a novel coronavirus that has not been previously recorded in human. COVID-19 is is transmitting mainly by respiratory droplet and/or contact, person to person transmission had been pinpointed. COVID–19 may suggest with mild, moderate, or severe illness; the latter includes serious pneumonia. Early recognition of those with serious manifestations grants for urgent advanced supportive care managements and safe, fast entrance (or referral) to intensive care unit according to national obligations. For those with mild disturbance, hospitalization may not be requested unless there is interest for rapid devaluation. All patients pardoned for home should be disciplined to return to hospital if they progress any worsening of illness. We attained good and necessary results for conducting an intubation process for patients who enter intensive care unit in hospitals. We recommend that auxiliary oxygen be given immediately until SpO<sub>2</sub> is 100% and presence of viral filtration during intubation technique. The aim of this review was to provide the best practices of intubation and ventilation amid this mass medical emergency and decrease mortality rate.

**Keywords:** Intensive care unit, COVID-19, Intubation, Critical care, Anesthesia, Recommendation.

\*Corresponding Author Email: [safabakrbakr@gmail.com](mailto:safabakrbakr@gmail.com)  
Received 01 June 2020, Accepted 26 June 2020

Please cite this article as: Safa B., Management of COVID-19 Suspected Patients in Critical Care Unit: An Overview Recommendations. American Journal of PharmTech Research 2020.

## INTRODUCTION

Coronavirus disease 2019 (COVID 2019) is a disease caused by one type of coronavirus, a novel coronavirus epidemic in 2019. It firstly emerged in Wuhan, Hubei region of china at the end of 2019, and has transmitted to the all country. COVID 2019 is defined as the class B infectious disease conferring to the China rules on the Prevention and Control of Infectious Disease (PRCPCID).<sup>1</sup> The virus infection can cause a new type of coronavirus pneumonia (COVID 2019 illness). Main explanations include fever, weakness and dry cough. Severe cases of the disease experience dyspnea and /or hypoxemia, difficulty in breathing one week after illness. In serious cases, the disease can appear fast and progress to the acute respiratory unhappiness syndrome, may cause septic shock, coagulopathy and metabolic acidosis and, which crucial to correct. In sever cases, endotracheal incubation is required in patients who are severely infected with novel coronavirus infection, the deft panel of airway management in Chinese Society of Anesthesiology has consider and devised instructions on proper process of tracheal intubation in critically sick people who are infected with Covid-19. Those recommendations can provide the guidance for the frontline anesthesiologists and critical care physicians on achievement of endotracheal intubation.<sup>2</sup> though instruction is quickly deriving, at the point where it is noted that though most of patients get only very no-mild symptoms, few patients showed critical symptoms, especially hypoxemic respiratory collapse. COVID-19 spread mainly through respiratory and mouth droplets like influenza and other coronaviruses and/or through contact (e.g., pollutes hands with particles of mucous). Person to person disease transmission had been indicated.<sup>3</sup> It is often difficult to know for convinced whether a singular patient needs to be nursed postoperatively in the comprehensive care unit (ICU), if one exists in your hospital. The person forming the decision, whether surgeon or anesthetist, has to stabilize the risk of patient dying from a pointless cause on the traditional ward against the waste of expensive sources if a patient is entered to ICU for no good reason.<sup>4</sup>

### **Clinical agreement making admission to ICU:**

The decision to intubate can be accessible and require slight consideration, as for patients with cardiopulmonary arrest or a lost or jeopardized airway. It can also be a judgment that lacks quality evidence for intelligence and, thus, is a decision made at the discretion of the treating physician. In patients with acute hypoxemic respiratory collapse lead to COVID-19, it can be challenging when electing whether to proceed with intubation and invasive ventilation.<sup>5</sup> Intensive care submission decision- making should be steady with normal ethical and legal frameworks:

- All patients should treat equally respectfully and should receive the good care. If Patients treated differently, it may cause assumed future pressures; it is necessary to focus on

current clinical demands and available resources.

- Determine what kind of care necessary to provide and useful to the patient, For example, the best available confirmation on factors that predicted this and applying it to the specific situation of the patients being managed. Decision support tools made for COVID-19 are available (NICE pathway) and may be helpful to guide these discussions and decisions. As more evidence and experience of managing COVID -19 become available, these tools will become more valid and relevant for patients within the national health services (NHS).<sup>6</sup>

### **Intubation and other procedures:**

Airway procedures such as intubation of the tubes, bronchoscopy, and open suction should be carried out very carefully using PPE standards such as using goggles and masks, to avoid being contaminated with aerosol and dust. closed inline suction catheters is a good choice to use for invasive ventilation. Disconnection of the infected person from the ventilator is not allowed and should be followed in a proper observation to prevent lung recruitment and aerosolization. If its needed, the endotracheal tube must be fixed by a clamp and the ventilator deactivate (to prevent aerosolization). Using of metered dose inhalers is more preferable than using nebulizers where possible. Intubations must be carried out by an expert physician who are highly expertise in airway and intubation management. To minimize aerosol formation, its better to use a rapid sequence induction without intermittent bag mask ventilation.<sup>7</sup> Using video-laryngoscope for intubation is more preferable because it will keep the distance between patients and physician. Avoid using stethoscope to ensure the correct tube placement and using direct visualization and CO2 indicators is more preferable. Following PPE is still required to practice correctly in the case of cardiopulmonary arrest and subsequent cardiopulmonary resuscitation. Airway practices requires to be carried out quickly and decrease the number of people around the area.<sup>8</sup>

### **Recommendations for airway management in COVID-19 patients:**

Ventilation rooms having a negative pressure containing an anteroom are a good choice to minimize contact with particles of aerosol and droplet. In the place Where negative pressure ventilator room is not available, normal rooms can be used, but with closed windows and doors to stop air movements. In addition, areas with positive pressure should be basically avoided for Covid-19 patients.

Many hospitals have made required spaces to control airway management of COVID-19 patients (e.g. isolation rooms airborne respiratory diseases). The advantages of this way of management should be balanced against the managing of transporting patients around the hospital and also between rooms and room cleaning between patients. To make a decision to move a normal patient

between two areas of clinic, the situation should be controlled and this should be practiced by more experienced staff to provide a safer airway management process.

**General principles Equipment, monitoring and medications:**

Its necessary to provide disposable tools and equipment to avoid reusing equipment's and tool to contain the transmission of the disease. If there is not disposable item in the area, the time resource and infection risk implications of providing reusable tools and equipment must have priority depending on the patient's cases. Using dedicated reusable items and equipment for COVID-19 patients is preferred where its available.

**Pre-oxygenation Oxygen delivery and ventilation equipment:**

Its necessary to carry out pre-oxygenation by utilizing a well-fitting e-face mask linked to a manual ventilator with provided an oxygen source. A very specialized filter for virus filtration should be available between the mask on the patients face and the manual ventilator to stop circuit contamination and minimize inhaling aerosols in exhausted gas of the non-rebreathing circuits. Its necessary to put the filter directly to the mask to avoid disconnection of the mask from patients face and by this way the patients remain safer.

An anesthetic equipment having circle system, a hand-held circuit or self-inflating bag valve mask fixed to a mask is a good choice to use. When bag slump during using mapleson and circle systems gives a sensitive warning of face mask leakage and this must be considered for clinicians who are expert with this equipment's. For anesthetics, end-tidal oxygen monitoring (ETO<sub>2</sub>) and manometry are more preferable to use in an anesthetic device. As the virus contamination is not allowed through inhaling under ventilator, non-rebreathing and/or the rebreathing must not be considered in selecting between these alternatives.

Suboptimal pre-oxygenation and aerosolisation enhancer is not provided in rebreathing masks, therefor, they are not recommended to use. In addition, its better to avoid using nasal oxygen treatment during pre-oxygenation or for apneic oxygenation because of its potential risk to the team.

**After intubation Oxygen delivery and ventilation equipment:**

We can deliver oxygen through mechanical ventilators in ICU or operating theatre anesthetic machines or emergency department (ED). The using of the both machines depend on availability of the machines and the place where the patients are kept. We can install the main airway trolley outside the isolation and treatment room, its recommended to use a dedicated COVID-19 airway trolley or pre-prepared COVID-19 intubation tray. Supraglottic airways

When supraglottic airway is a choice, the utilizing of a second generation machine is preferable,

because it has a higher seal pressure during positive pressure ventilation and by this way the risk of aerosolisation of virus will be decreased.

**Video laryngoscopy:**

It is recommended that video laryngoscopy can be gained; it must be urgently available in the room when tracheal intubation is practiced. A video laryngoscope should be devoted to utilize in patients with COVID-19 disease, and disposable video laryngoscope blades are recommended. Both Macintosh and hyper angulated blades should basically be exist-hyper angulated blades must only be utilized by experts who are expertise in their use.

**Suction:**

Closed suction systems must be utilized to minimize aerosolisation when the patient is intubated.<sup>7</sup>

**Admission of COVID-19 patient to Intensive Care Unit (ICU):**

1. Positive COVID -19 or presumed cases entered to the ICU will be protected from and/or stopped from contact and droplet precautions.
2. A point –of-care risk assessment (PCRA) should be carried out before interaction between patients with a suspected case irrespective of location. The frequency and probability of emergent or routine aerosol generation must be considered at the PCRA.
3. N95respirators or same level of protection should be utilized by health workers in care locations where AGMP are carried out, are common or may happened with intubated Covid-19patients.

**AGMP defined as:**

- a) Intubation and commonly related practices (e.g. manual ventilation, open endotracheal suctioning, extubation)
- b) Cardio-pulmonary resuscitation (CPR)
- c) Non-invasive ventilation (e.g. Bi-level positive airway pressure (BiPAP), continuous positive airway pressure (CPAP)
- d) Humidified high flow oxygen systems (e.g. ARVO, Opti flow)
- e) Tracheostomy care
- f) Bronchoscopy
- g) Septum induction
- h) Nebulized therapy /aerosolized medication administration
- i) Open respiratory /airway suctioning
- j) High frequency oscillatory ventilation.<sup>3</sup>

The aim of this review study was to provide the best practices of intubation and ventilation amid

this mass medical emergency and decrease mortality rate.

### **Evidence and Acquisition**

The Chinese Society of Anesthesiology Task Effort on Airway treatment released a rapid-track publication with the suggestion to go on with endotracheal intubation for patients demonstrating no improvement in respiratory distress, tachypnea (respiratory rate higher than 30 per minute), and low oxygenation ( $P_{aO_2}$  to  $F_{iO_2}$  ratio less than 150mmhg) after 2-hr high-particular epidemic, intubation is more much used as a salvage therapy than a proactive means of bolstering patients whose oxygenation is progressively refusing and oxygen debt places increasing.<sup>5</sup>

On February 18, 2020, China released question and interpretations of tracheal intubation for Covid-19 patients, in which the principles for tracheal intubation were interpreted as oxygenation index  $<150$  mmhg after a minimalist 2hr of extended positive airway pressure with 100% oxygen, and its preferable that intubation be appointed more than emergent. According to the current criteria, patient would get intubation and ventilation treatment easier, as a result higher patients need intubation. In many hospitals, airway executive team's consisting of expert anesthesiologists were equipped to reach the wish for intubation.<sup>9</sup>

In patient with ARDS, universal guidelines prescribe a tidal volume (TV) of  $<6$ ml/kg ideal body weight and a highland pressure for no more than 30 cm H<sub>2</sub>O. Confident End-Expiratory Pressure (PEEP) can be conformed according to the ARDS network tables.

Modest and severe ARDS requires higher PEEP.

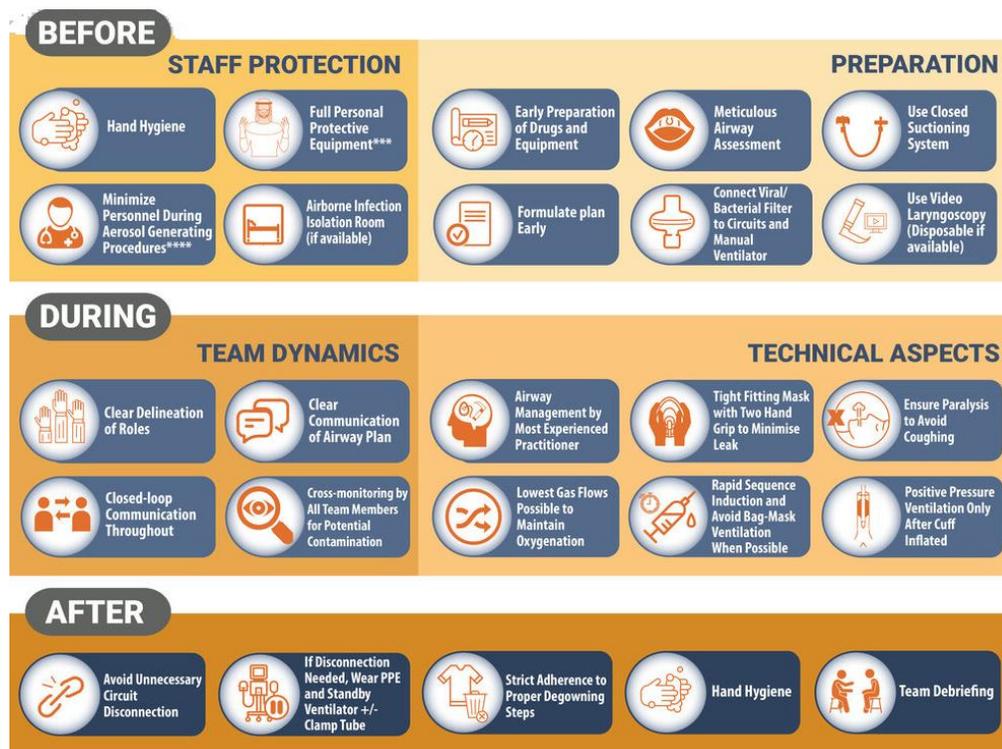
In ARDS with  $P_{aO_2}/F_{iO_2} < 150$  mmhg prone seat should be carried out consistently for 16 hr. When severe hypoxemia exists, prone seat needs to be repeated.<sup>8</sup>

In US patients with COVID-2019 severe urgent respiratory syndrome often need endotracheal intubation and automated ventilation. While the prognosis of intubated patients is little set up on currently convenient data, some research revealed that a subset of patients is needed prolonged times invasive automated ventilation. Tracheotomy may be expressed for those intubated higher than 21 days who differently have a good prognosis and little comorbidity. A multidisciplinary deliberation of the patient's goals of care, overall prediction, and expected profits of tracheotomy is a critical sector of the decision-making process. If tracheotomy is executed, specific measure to dull the risk of transportation to health care personal should be required.<sup>10</sup>

For adults infected with COVID-19 and acute hypoxemic respiratory collapse in spite of conventional oxygen therapy, clinician outreach & communication action COCAs suggested that using High Flow Nasal Cannula (HFNC) over traditional oxygen therapy is more acceptable.<sup>11</sup> More experts with experience administering COVID -19 patients suggest fast intubation.

Nonetheless, the interpretation what constitutes early is ambiguous. Use of noninvasive means is traditionally adopted to avoid intubation. However, their use is susceptible to argument in patients with COVID-19. Physician should communicate strictly and systematically about the potential for intubation in patients that are being pursued and treated noninvasively so that the development can be smooth and rapid signs it has been shown that the patients' wants intubation during reduction of improvement on 40L/minute of high stream oxygen and a portion of inspired oxygen (FiO<sub>2</sub>) > 0.6.<sup>21</sup> First of induction of general anesthesia, preoxygenation was executed for 5 min in all patients either handling a face mask supply 100% oxygen and hypoxaemia, which is often continued.<sup>12</sup>

High ICU workloads to staffing rates are correlated with a raise in patient's fatality. 114 enhancements of staff with teammates from other ICUs or indeed non ICU might be needed. Training of extra staff on ICU practices administration and especial COVID -19 protocols is necessary.



**Figure 1: Clinical and safe endotracheal intubation guideline for critically ill patients with COVID-19 patients<sup>15</sup>**

Staffing of ICUs should put into explanation the risk that health workers may gain a disease of SARS and CoV-2, reducing the risk of the disease is necessary, not only because of the direct loss of worker but because of the possibly destructive effect of staff infection on attitude, which might emerge in absence from work. Health-care staffs in ICU are especially susceptible to mental health

issues, such as depression and anxiety, from outbreaks like COVID -19, because of the consistent fear of being infected and the exhausting workload.<sup>4,7</sup>

## Methods

CDC confirmed that at a minimum Personal Protective Equipment (PPE) must include impenetrable gown, theatre hat, N95 mask, face shield, eye preservation, and consider dual gloves.<sup>13</sup> The Chinese society of Anesthesiology Task effort on airway management recommends fit-tested N95 masks, hair cover, possessive cover all, gown, gloves, face shield sand goggles, shoe protects. If available, medical possessive head hood or powered air purifying respirator must be handled. Goggles and glasses to be provided for anti-fog (figure 1.).<sup>14</sup>

We described the reference for this report trench publisher of PubMed for articles reported between Jan 1 2020, and April 20, 2020, using consolidations of the word coronavirus, COVID-19, SARS –COV-2, Sever urgent respiratory distress (SARS), MERS, Outbreak, outbreak, pandemic, sever acute respiratory syndrome, and, intensive care intervention. We reviewed instruction for the management of COVID-19 published by WHO and the US centers for disease control and prevention. We replied articles through searches of the author's special files. Also, we reconsidered relevant references cited in repaired articles. Articles reported in US, English and Chinese were included. The eventual reference list was generated on the base of importance to the topics covered in this report, with the target of highlighting the multiple challenges the intensive care community may be appear in the management of COVID-19, and providing recommendations for sailing these complex.

## RESULTS AND DISCUSSION

During the follow-up and reading of some of the higher researches, we obtained good and important results for conducting an intubation process for patients who enter intensive care facilities in hospitals. These results and tips are shown in the lower table in order to follow up and apply them to patients who enter our region's hospitals so that we can produce a good result and get the patients recovered and removed From death because our country does not have a strong health system, if God forbid, no disaster happened, and the number of patients increased.

### **Among the most important things for this disease is:**

- Quick diagnosis of the patient
- It is separated from the friction of others
- Giving healthy procedures necessary
- And the most important thing especially for those who need the ICU is early intubation and giving oxygen at a dose of SpO2 100%.

## Preparations

Assess patient's airway outside the room.

Short huddle to confirm roles and develop overall plan including back-up strategy MD Airway to request additional support if needed.

### Prepare equipment to bring into room:

- ICU COVID-19 airway checklist.
- Airway equipment: Endotracheal tube, cuff syringe, bougie
- Ventilator with in-line suction
- Rapid sequence intubation (RSI) medications
- Paralytic: must be 100 mg rocuronium bromide or greater (1.2mg/kg)
- Induction agent: ketamine, midazolam, fentanyl, propofol doses
- Consider starting norepinephrine infusion at 0.1mcg/kg/min prior to sedative medication
- Outside room as per MD Airway-fiberoptic scope, Cricothyrotomy Kit, LMA.
- The viral filter should be applied directly to the face mask.

### Don the following:

- Lanyard contains personal ID card, stethoscope, phone, and accessories.
- Pairs with partner double-checking PPE
- Follow directions on Enhanced droplet/contact PPE with N95 for aerosol generating medical procedure (AGMP)

### Detailed airway assessment

- Ask for assistance if difficulty anticipated
- Optimize patient position
- Set up video laryngoscope

### Begin passive pre oxygenation

- Bag Valve Mask (BVM) with filter
- Two-handed technique for mask seal
- Allow suboptimal O<sub>2</sub> states to avoid or minimize assisting ventilation

### Intubation

Ensure that the protected airway checklist is completed proceed with RSI:

- Wait 60 seconds for peak rocuronium effect
  - Intubate with video laryngoscope bougie

- After visualization of the tube passing the vocal cords, immediately inflate the cuff and connect filter and BVM with color capnography for CO<sub>2</sub> confirmation of tube placement
- Use as few breaths as possible
- After an exhalation , Clamp Endo Tracheal Tube (ETT), remove BVM and attach the ventilator circuit With in-line suction directly to the ETT
- Place bite block and secure tube
- If rescue airway management is required:
- Stay calm
- Call for assistance
- 2<sup>nd</sup> MD may enter room with airway adjuncts as previously decided
- 2 person BVM with small tidal volumes
- Consider rescue equipment and consider surgical airway

#### **Post intubation management:**

- Insert OG tube while in AGMP PPE
- Apply soft restraints
- Consider arterial line and central line placement prior to exiting the room

Allow appropriate time for air exchange prior to de-escalating PPE individual patient rooms in ICU require 1 hour for air exchange so enhanced droplet/contact with N95 for AGMP should be worn when entering during this time.

Regarding to viewing and observing the above research article which was conducted on COVID-19 patients who admitted in to the intensive care unit in hospital, we got to the below important recommendations which is shown in table 1.

**Table 1: The safety and efficacy of respiratory support intervention for those patient in critical care unit who infected with COVID-19.**

<b>Strength of intervention and recommendation</b>	<b>Introduction</b>
Strong	In patients with COVID -19 with intense respiratory distress syndrome (ARDS) and respiratory collapse, hypoxemia or shock (who are not intubated or getting automated ventilation, we recommend that auxiliary oxygen be given urgently until SpO <sub>2</sub> is 100%
Strong	For patients with COVID-19 and acute hypoxemic respiratory distress who are getting oxygen we recommend that SpO <sub>2</sub> be sustained at no higher than 100%
Good practice	High-flow nasal cannula (HFNC) and non- invasive ventilation (NIMV) must be used in units where patients with find out or confirmed COVID-19 are admitted to hospital only if the area is completely ventilated or has a negative pressure system and if all health care worker in the area use correct airborne

	restriction. If this is not achievable, it is preferable to use automated ventilation with orotracheal intubation.
Strong	In automated ventilated patients with COVID-19 and ARDS it is prescribed to use low tidal volume ventilation (4-8ml/kg of envisioned body weight) and to predict plateau pressure below 30 cm H <sub>2</sub> O
In order to the patient's condition	For automated ventilated patients with COVID-19 and ARDS a conservative strong of positive end-expiratory pressure (PEEP) should be added to prevent brain trauma. (If using a higher PEEP planning, personnel must monitor patients who don't responded to higher PEEP levels for body cavity trauma)
Strong	For automated ventilated patients with COVID-19 and ARDS using conservative fluid protocol is prescribed, as opposed to a liberal fluid protocol.
Strong	For automated ventilated patients with COVID-19 and moderate to severe ARDS, prone ventilation, for 12-16 hours demonstrated, as opposed to non-prone ventilation. This will need satisfactory human resources and expertise to do the procedure safely and in a under the protocols.
In order to the patient's condition	For automated ventilated patients with COVID-19 and moderate to severe ARDS who are in need of automate ventilation: <ul style="list-style-type: none"> <li>• Recurrent boluses of neuromuscular blocking agent (NMBA) are proposed, as opposed don NMBA infusion, in order to facilitate proposed lung ventilation</li> <li>• In the onset of persistent ventricular dysynchrony and need for follow deep sedation, prone ventilation, or persistently more level plateau pressures, we propose using an extended NMBA infusion for up to 48 hr.</li> </ul>
Strong	In automated ventilated patients with COVID-19 and ARDS, the use of inhaled nitric oxide is not recommended
Strong	For automated ventilated patient with COVID-19 and refractory hypoxemia despite upgraded ventilation, the use of recruitment manipulations is recommended: incremental PEEP (gradual increase in PEEP) is not prescribed.
	Oxygenation and automated ventilation can be conveyed using operating theatre anesthetic machines or automated ventilators (in ICU or ED). While both machines have advantages and disadvantages, the choice will presumably depend on their availability and the site of patient care than personality characteristics.
Strong	It is suggestion of extra corporeal membrane oxygenation (ECMO), if available, or on acceptable of patients to an ECMO center be applied in the following cases of critically ill patients with COVID-19 and severe ARDS: <ul style="list-style-type: none"> <li>• Automated ventilated patient with COVID -2019 and refractory hypoxemia who does not responded to protocol therapeutic alternatives (ventilation optimization, use of rescue therapies, and prone ventilation)</li> <li>• It is recommended that ECMO not be useful for the following patients: <ul style="list-style-type: none"> <li>• Patients with end of disease or central nervous system damage</li> <li>• Patients over 65 years-old.</li> <li>• Patients who have under automated ventilation for more than 7 days.</li> </ul> </li> </ul>
Strong	Tracheotomy may be demonstrated in patients with more duration periods of intubation, mentioned as greater than 22 days, who are otherwise with any significant comorbidity and may be investigated to have a good prognosis if recovering.

Good practice	For patients with normal airway, a weak intubation should avoid and modified early sequence induction is highly recommendation. Sufficient muscle relaxant must assure before intubation. For patients with insufficient airway, good preparation of airway machines and detailed intubation plans should be available.
---------------	---



**Figure 2: Safe procedure intubation for COVID-19 patients**

Finally, we recommended using the following novel procedure which is shown in (figure 2) in order to protect the anesthesiology and other staff related during critical care intubation for coronavirus patients.

## CONCLUSION

Amongst COVID-19 patients requiring early intubation, a technique based on RSI and video laryngoscope enabled prompt tracheal intubation and was universally successful despite differing

approaches to PPE. Based on overall research review and expert opinion, we provide a follow to facilitate early tracheal intubation of COVID-19 patients and to improve safety of both patients and healthcare workers. The safe airway society principles of airway management and tracheal intubation specific to COVID-19 patient group were developed after expert consultation and review of the available literature. This above statement recommends safe, simple, familiar, reliable and robust practices that should be adopted for all episodes of airway management for patient with COVID-19 also; it is aimed to promote early education of all airway clinicians in our country. During the airway management, enhanced droplet/airborne PPE should be applied to the health care providers. A good airway assessment before airway intervention is of vital importance.

### ACKNOWLEDGEMENT

We acknowledge the presidency of Sulaimani Polytechnic University and especially Assistant Professor Dr. Alan Faraydoon Ali for his great help and academic support to performing this research. Also, we would like to appreciate Mam Humanitarian Foundation for their financial and logistic support.

### FUNDING/SUPPORT:

This is funded by the presidency of Sulaimani Polytechnic University, especially Assistant Professor Dr. Alan Faraydoon Ali and Mam Humanitarian Foundation.

### REFERENCE

1. S. Murthy, Ch. Gomersall, R. Fowler, "Care for Critically Ill Patients with COVID-19," *JAMA*, 323(15), pp. 1499-1500, 2020.
2. M. Zuo<sup>1</sup>, Y. Huang, W. Ma, Z. Xue, J. Zhang, Y. Gong, et al, "Expert Recommendations for Tracheal Intubation in Critically ill Patients with Novel Coronavirus Disease 2019," *Chinese Medical Sciences Journal*, 11(2752), pp. 35-39, 2020.
3. Provincial Critical Care Communicable Disease Working Group, "Care of the Adult Critically Ill COVID-19 Patient Annex D," *albertahealthservices.com*, Apr. 15, 2020. [online]. Available: <http://www.albertahealthservices.com>. [Accessed: Apr. 16, 2020].
4. J. Phua, L. Weng, L. Ling, M. Egi, Ch. Lim, J. Vasishtha, B. Raja, et al., "Intensive care management of coronavirus disease 2019 (COVID-19): challenges and recommendations," *Lancet respire med*, 8(2), pp. 506-17, 2020.
5. L. Meng, H. Qiu, L. Wan, Y. Ai, Z. Xue, Q. Guo, "Intubation and Ventilation amid the COVID-19 Outbreak," *Research Gate*, XXX(XXX), pp. 1-17, 2020.
6. Specialty guides for patient management during the coronavirus pandemic, "Clinical guide for the management of critical care for adults with COVID-19 during the coronavirus

- pandemic,” patient Safety Learning, 2(8), pp. 109-134, 2020.
7. D. Brewster, N. Chrimes, T. Do, K. Fraser, Ch. Groombridge, A. Higgs, “Consensus statement: Safe Airway Society principles of airway management and tracheal intubation specific to the COVID-19 adult patient group,” safe airway society, 1(1), pp. 1-10. 2020.
  8. S. Kluge, U. Janssens, T. Welte, S. Weber-Carstens, G. Marx, C. Karagiannidis, “German recommendations for critically ill patients with COVID-19,” Medizinische Klinik, 115, pp. 175–177, 2020.
  9. M. Yang, H. Dong, Zh. Lu, “Role of anaesthesiologists during the COVID-19 outbreak in China,” British Journal of Anaesthesia, xxx (xxx), pp. xxx (xxxx), 2020.
  10. T. Chao, B. Braslow, N. Martin, A. Chalian, J. Atkins, A. Haas, et al., “Tracheotomy in ventilated patients with COVID-19,” annals of surgery, 1(10), pp.1-7, 2020.
  11. CDC, “Clinical Management of Critically Ill Adults with COVID-19,” Centers for Disease Control and Prevention, 770(488), pp.1-104, 2020.
  12. W. Yao, T. Wang, B. Jiang, F. Gao, L. Wang, H. Zheng, et al., “Emergency tracheal intubation in 202 patients with COVID-19 in Wuhan, China: lessons learnt and international expert Recommendations,” British Journal of Anaesthesia, xxx (xxx): xxx (xxxx), 2020.
  13. Shared health soinscommuns, “ICU COVID PROTECTED INTUBATION” Manitoba, 2020. <https://www.sharedhealthmb.ca>
  14. D. Weissman, M. de Perio, L. Radonovich, “COVID-19 and Risks Posed to Personnel During Endotracheal Intubation,” JAMA, xxx(xxx), pp. E1-E2, 2020.
  15. CDC, “Management of the critically ill patient with confirmed or suspected COVID-19”, Centers for Disease Control and Prevention, Intensive care society of Ireland, 2020 <https://www.cdc.gov/coronavirus/2019-ncov/hcp/download>

***AJPTR is***

- Peer-reviewed
- bimonthly
- Rapid publication

Submit your manuscript at: [editor@ajptr.com](mailto:editor@ajptr.com)

