Management of Coronavirus Disease 2019 Intubation Teams

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Some patients infected with the Coronavirus Disease 2019 (COVID-19) require endotracheal intubation, an aerosol-generating procedure that is believed to result in viral transmission to personnel performing the procedure. Additionally, donning and doffing personal protective equipment can be time consuming. In particular, doffing requires strict protocol adherence to avoid exposure. We describe the Emory Healthcare intubation team approach during the COVID-19 pandemic. This structure resulted in only 1 team member testing positive for COVID-19 despite 253 patient intubations over a 6-week period with 153 anesthesia providers on service. (A&A Practice. 2020;14:e01263.)

GLOSSARY

CDC = Centers for Disease Control and Prevention; COVID-19 = coronavirus disease 2019; HME = heat and moisture exchange filter; IRB = Institutional Review Board; PPE = personal protective equipment; SARS = 2003 severe acute respiratory syndrome; SARS-CoV-2 = severe acute respiratory syndrome coronavirus 2

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intubations. This third team member was tasked with acting as a runner to obtain additional supplies from the operating room or to prepare for subsequent intubations in the event of simultaneous calls.

**EQUIPMENT**

Our airway team adapted an airway bag that had been used before the pandemic (Figure 1). In addition to multiple sizes of endotracheal tubes, a portable video laryngoscope, a bougie, supraglottic airways, surgical airway equipment, oral airway, nasal trumpet, we added an endotracheal tube clamp, bacterial/viral heat and moisture exchange (HME) filters, N95 respirators, gowns, full face shields, and goggles. The airway bag remained outside the patient’s room during intubation. A video laryngoscope was utilized for all intubations. A foldable, custom-designed transparent acrylic airway box was used in some intubations as an enhanced form of PPE at the discretion of the physician anesthesiologist. Nondisposable items were wiped down with disinfectant wipes inside the patient’s room, handed to team members outside the room, and then wiped down again.

**PROCESS**

While many patient rooms are negative pressure rooms, our routine did not vary. Before entry into the COVID-19–positive patient room, a prebrief is held with all members of the anesthesiology team, the respiratory therapist, and the nurse assigned to the patient. A discussion of everyone’s role is reviewed, and an overview of necessary airway equipment and medications is discussed. Only equipment and predrawn medications (including induction agents, neuromuscular blocking agents, and vasopressors) are taken into the patient room. Most inductions are performed using propofol and rocuronium. Providers have a choice of phenylephrine, norepinephrine, and epinephrine.

All providers in the room wore a face shield, gown, gloves, and a respirator. The respirator was a fitted N95 mask. If the provider was unable to wear an N95, they wore a powered air-purifying respirator. This is verified using a checklist card given to all team members to carry at the beginning of the pandemic and displayed prominently on the patient’s door. A respiratory therapist brought and set up a ventilator, with the initial settings being provided by the anesthesiologist. The nurse and anesthesiologist then enter the room. Occasionally an allied team member entered the room at the discretion of the physician anesthesiologist to assist with airway management. After verification of endotracheal intubation, the airway team confirmed appropriate doffing of PPE following the displayed checklist. Doffing of the gown occurred within the patient’s room. The remainder of the PPE was removed outside the patient’s room. If a second intubation was called in short succession, the team would doff gowns and gloves only and maintain face shields and N95 respirators regardless of proximity of rooms.

**COVID-19 HOTLINE AND AVAILABILITY OF TESTING**

Emory Healthcare developed a COVID-19 hotline staffed by nurses. All employees who were concerned that they had symptoms were instructed to contact this number. Staff members were asked about symptoms according to guidance provided by the CDC. Symptoms included fever, chills, cough, shortness of breath, difficulty breathing, fatigue, myalgia, headache, and new loss of taste or smell. Employees were given priority for testing if they reported concerning symptoms.

**RESULTS**

In the 6 weeks since creation of our COVID-19 intubation teams, a total of 253 intubations were performed (Figure 2). Sixty-four individual anesthesiologists and 89 allied team members staffed the service. During this period, all patients were intubated within 30 minutes of the request for intubation and there were no cardiac arrests, deaths, or emergency surgical airways required during intubation.
demonstrates the temporal relationship of the 16 team members (10.5% of the total team) who requested SARS-CoV-2 testing during this time period. Only 1 member tested positive (0.7%) following a shift on the intubation team.

PPE supplies were adequately maintained through both decontamination of N95 masks as well as through additional health care system procurement. After use, N95 masks were placed into paper bags. They were reused throughout a 12-hour shift and then returned to the hospital inside of a labeled paper bag for decontamination using ultraviolet light.

DISCUSSION
During the 6 weeks described in this article, 253 known COVID-19 patients were intubated with only 1 member being diagnosed with COVID-19 as a result of their study. Mortality is significantly lower in COVID-19 patients cared for in the Emory Healthcare system as compared to other US hospitals.7 The structure and availability of the teams may have contributed to these initially reported favorable outcomes by allowing rapid access to intubation performed by attending anesthesiologists.7,8 Emory’s initial intensive care unit intubation rate of 76% compares similarly to initial reports from Seattle (75%)9 and Chicago (86%).10 Additionally, the team structure, availability of PPE, and strict checklist adherence led to low incidence of infection among members of the intubating team.

Criticisms of this model include the additional expense of maintaining 1 physician anesthesiologist and 2 allied team members dedicated to intubations in each facility, in addition to the regular cohort of staff dedicated to staffing operative cases. Additional criticism may be that other medical professionals, such as emergency medicine or critical care physicians, or even respiratory therapists can perform these intubations for lower cost. The physicians and allied team members are salaried in our health care system. With the elimination of elective operative cases, there was a relative abundance of anesthesia staff, while these other specialists were frequently busy in the emergency department and intensive care units. Anesthesia providers can intubate patients, but also treat acute complications of intubation.

Having a dedicated airway team not distracted by comanagement of patients in the operating room allows team members to intubate patients without perioperative production pressures. Similarly, self-sufficient airway teams spared intensivist physician’s time intubating patients, allowing them to focus on other aspects of critical care management.

CONCLUSIONS
Dedicated airway teams effectively provide emergency patient care while maintaining staff safety. Safety was enhanced by providing sufficient resources for providers to be able to focus on direct patient care and by the utilization of checklists for the use of PPE.

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REFERENCES