Novel Coronavirus 2019 and Anesthesiology

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The outbreak of severe acute respiratory syndrome that began in Wuhan, Hubei Province, China, first came to international attention in December 2019, was quickly attributed to a novel coronavirus, and was officially named "Coronavirus Disease 2019" (COVID-19) by the World Health Organization on February 12, 2020. This outbreak spread at unprecedented speed through China, and then internationally, and continues to broaden geographically and in the number of individuals infected and symptomatic. As of this writing, the number of people infected worldwide has surpassed 100,000, with more than 80 countries affected and several country clusters of infection. This problem is evolving at a dizzying pace.

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Unlike nearly all of what is published in Anesthesiology, which tells of research and events already complete, we are challenged to communicate about something that is still happening, where our content will be "old" by the time it is published. Nevertheless, anesthesiologists may encounter and care for patients with COVID-19 through their roles as experts in emergent airway management, acute and intensive care, and perioperative anesthesia, and the care they provide imposes a significant risk for their own health. Our goal is to bring trusted evidence on COVID-19 to our readers, as best we know it now.

Polio was the most feared disease of the twentieth century. On April 12, 1955, the day that Dr. Jonas Salk, the developer of the polio vaccine, declared it "safe, effective and potent," the iconic newsman Edward R. Morrow interviewed Salk and asked who owned the patent. "Well, the people, I would say. There is no patent." That now-famous response exemplifies the concept of public health for public benefit.

This issue of Anesthesiology contains several articles on COVID-19, from China and elsewhere. Many of the authors are anesthesiologists who were at the epicenter of the coronavirus outbreak, either because they resided there or were swiftly relocated to deliver care. Their challenge was to respond quickly, effectively, and safely against something about which they initially knew little. The experience gained in China offers valuable lessons for other practitioners as the wave of coronavirus infection rolls through other countries. These Chinese authors contacted Anesthesiology asking to share their experience of providing care and protecting themselves so that others—patients and practitioners—could benefit. This is another example of public health for public benefit.

"Perioperative Management of Patients Infected with the Novel Coronavirus" by Dr. Xiangdong Chen *et al.*, working in Wuhan at the initiation of the outbreak, is a Special Article that presents recommendations from the joint task force of the Chinese Society of Anesthesiology and Chinese Association of Anesthesiologists on the management of patients in the perioperative setting and on emergency airway management outside of the operating room. These were based on the practice and experience of the frontline anesthesiologists who provided care to the patients in China. Major elements of these recommendations include precautions for perioperative care for patients suspected or confirmed with COVID-19, considerations for emergency tracheal intubation of patients outside of the operating room, and surveillance of anesthesia providers who cared for these patients. We acknowledge the leadership of Dr. Yuguang Huang, President of the Chinese Society of Anesthesiology, and Dr. Weidong Mi, President of the Chinese Association of

Image: Adobe Stock.

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Anesthesiologists, in leading the creation and promulgation of these recommendations. In addition, we greatly appreciate their proactively sharing them with Anesthesiology for publication and the benefit of patients and practitioners.

"Response of Chinese Anesthesiologists to the COVID-19 Outbreak" by Dr. Hong-Fei Zhang *et al.* in Guangzhou, Shanghai, and Wuhan is a Special Article that discusses the effect of COVID-19 on anesthetic care and anesthesiologists and the measures taken by the Chinese anesthesiology community. It describes anesthesia practice in the epicenter of Wuhan and how anesthesiologists were affected through two stages: December 2019 to January 2020 and January 2020 to the present. Hospital capacity and practitioners were quickly overwhelmed, necessitating the exigent relocation of thousands of healthcare workers and the emergent *de novo* construction of entire new hospitals. A high percentage of patients needed oxygen therapy and/or ventilatory support, and special intubation teams were created. Numerous healthcare workers themselves became infected. Communication, both domestically within China and internationally, helped quickly educate practitioners and distribute needed resources.

"Intubation and Ventilation amid the COVID-19 Outbreak" by Dr. Lingzhong Meng *et al.* is a Special Article that provides firsthand experience and in-depth analysis on airway and pulmonary management. They describe severe hypoxemia, often common and prominent and refractory to noninvasive ventilation, in patients with COVID-19, approximately 3% of whom required intubation and invasive ventilation. Specific details about practices of intubation and ventilation in critically ill patients in Wuhan are provided. Although elective surgery ceased, emergency surgery continued. The article also described, in detail, the risk to healthcare providers, nearly 2,000 of whom became infected, and the efforts regarding personal protection and personal protective equipment.

"Establishing and Managing a Temporary Coronavirus Disease 2019 Specialty Hospital in Wuhan, China" by Dr. Weihong Zhu *et al.* is a Special Article that describes the creation of COVID-19 specialty "ark hospitals," similar to military mobile medical units. These temporary hospitals enabled rapid response, were quicker and cheaper to build, and could centralize COVID-19 patient management without the risk of cross-infection among patients. The authors describe the substantial barriers and the strategies for building and operating a temporary COVID-19 specialty hospital and their remarkable achievements.

"COVID-19 Infection: Implications for Perioperative and Critical Care Physicians" by Dr. John Greenland *et al.* offers a U.S. perspective from anesthesiologists, pulmonologists, and critical care physicians. They review COVID-19 pathogenesis, presentation, diagnosis, and potential therapeutics with a focus on management of COVID-19–associated respiratory failure. The article draws on recent publications on COVID-19, as well as other coronaviruses, acute respiratory distress syndrome, and guidelines from major health organizations. COVID-19 patients can progress to hypoxemic respiratory failure or multisystem organ failure, necessitating intubation and intensive care management, and in extreme cases, extracorporeal membrane oxygenation or surgical procedures may be required. This review provides a comprehensive summary of evidence available to guide management of critically ill patients with COVID-19.

"Preventing Infection of Patients and Healthcare Workers Should Be the New Normal in the Era of Novel Coronavirus Epidemics" by Drs. Andrew Bowdle and L. Silvia Munoz-Price, an anesthesiologist and an epidemiologist, respectively, is an Editorial about infection control and transmission. It reinforces the message of the Special Articles that novel coronavirus outbreaks may be particularly hazardous to healthcare workers. It reminds practitioners that hospital-acquired organisms can originate from the anesthesia workplace and the hands of anesthesia providers; that providers should be familiar with airborne isolation procedures, which are seldom necessary for routine anesthesia practice; and that operating rooms should consider having a dedicated anesthesia cart for high infection risk situations. Similarly, a Letter from Dr. Mengqiang Luo *et al.* addresses precautions for intubating patients with COVID-19. It reinforces concepts of safety for patients and also for care providers, whose ability to deliver care depends on their own health.

These articles offer, through firsthand account and scholarly review, lessons about the novel 2019 coronavirus and the healthcare response that it galvanized. The scale and speed of the COVID-19 epidemic are unprecedented, and mobilization of Chinese health providers to control the epidemic was impressive. Anesthesiologists in Wuhan and those rescue teams sent to Wuhan were some of the specialists who were first responders, and they were seminal in critical care, emergent airway management, respiration, ventilation, oxygenation, and personal protective equipment training for airway management and critical care. Approximately 1,000 anesthesiologists from outside Hubei Province relocated to deliver care. Mechanisms and risks of transmission and of provider infection were initially unknown. Protocols for care had to be emergently created. Facilities were rapidly overwhelmed, new large hospitals designated to care for patients with COVID-19 were constructed in just days, and one temporary facility took only 33 h from initial planning to full operation and patient admission. Anesthesiology leadership, both locally and nationally by the Chinese Society of Anesthesiology and Chinese Association of Anesthesiologists, was vital. Fortunately, the coronavirus infection rate in China appears to be decreasing. Identification of the mode of transmission and application of corresponding precautionary measures diminished infection of Chinese healthcare workers and the general population. Nevertheless, the infection rate is increasing elsewhere worldwide. We acknowledge the colleagues who have been and are providing care to patients in

China and elsewhere. It is hoped that the experiences and lessons learned and shared by Chinese anesthesiologists will be of benefit worldwide.

As rapidly as the coronavirus is spreading, so too is our ability to understand it, and the pace of discovery is unheralded. Investigators are sequencing coronavirus isolates daily. We have learned that it mutates often—about twice per month, and genomic epidemiology is using sequences to understand patterns of transmission and spread (https://bedford.io/blog/; accessed March 7, 2020). It is not without understanding that a journal that publishes monthly, with an article lead time of weeks, cannot keep abreast of these daily events. In addition to the articles in this issue of Anesthesiology, more comprehensive and more timely resources are available. These include the World Health Organization (WHO, https://www.who.int/emergencies/diseases/novel-coronavirus-2019; accessed March 7, 2020), Centers for Disease Control and Prevention (CDC, https://www.cdc.gov/coronavirus/2019-ncov/index.html; accessed March 7, 2020), European Centre for Disease Prevention and Control (https://www.ecdc.europa.eu/en/novel-coronavirus-china; accessed March 7, 2020), and university and research center websites (http://www.centerforhealthsecurity.org/resources/COVID-19/index.html; accessed March 7, 2020). For patient care, the CDC's Interim Clinical Guidance for Management of Patients with Confirmed Coronavirus Disease 2019 (COVID-19) (www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html; accessed March 7, 2020) and Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings (www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html; accessed March 7, 2020) may be particularly helpful.

Journals, including Anesthesiology, which publishes monthly, are not structured or resourced for ultrarapid publication; our authors are not accustomed to response requirements of hours or days rather than weeks; and our journal production process, while increasingly facile, is not used to a sudden injection of numerous major articles into the system at the last moment. Nevertheless, our authors, editors (Drs. Martin London and Jerrold Levy), editorial office, and production team rose magnificently to the challenge of swiftly writing, handling, reviewing, and publishing the suite of coronavirus articles contained in this month's Anesthesiology. We want to thank them publically, so that our readers know also and can appreciate their efforts.

Competing Interests

Dr. Kharasch is the Editor-in-Chief of Anesthesiology, and his institution receives salary support from the American Society of Anesthesiologists (Schaumburg, Illinois) for this position.

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