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Contents lists available at ScienceDirect

Journal of Cardiothoracic and Vascular Anesthesia

journal homepage: www.jcvaonline.com

Editorial

Critical Care During the Coronavirus Crisis— Reflections on the Roles of Anesthesiologists in Meeting the Challenges of the Pandemic



ANESTHESIOLOGISTS across the United States have a rich history in critical care that spans more than 60 years. The American Board of Anesthesiology first offered certification in critical care in 1986.¹ This development followed an unsuccessful attempt to create a unified board certification process for all critical care physicians from various backgrounds, including anesthesiology, internal medicine, pediatrics, and surgery.^{1,2} Since the introduction of board certification, the participation of anesthesiologists in critical care has not kept pace with that by other specialists from emergency medicine, internal medicine, and surgery who have expanded their role in adult critical care, including cardiothoracic critical care.¹⁻³ This lack of growth prompted concerns about the future of anesthesiologists in critical care both in the 1990s and early in the new millennium.^{1,3} It is likely that the participation of anesthesiologists in critical care throughout the United States continues to be highly variable depending on multiple factors, including sex, opportunities, and location.⁴⁻⁶

The current coronavirus pandemic and its catastrophic consequences have highlighted the imperative for anesthesiologists to be key stakeholders in critical care.⁷ In areas hit by the full intensity of the pandemic, anesthesiologists have converted postanesthesiology care units into intensive care units; deployed anesthesia machines as ventilators; and created acute-care teams to address the unique challenges of clinical care in this setting, including airway management.⁷⁻¹¹ Beyond direct clinical care in the frontlines of the pandemic, anesthesiologists also are leading operations for surge planning, educating physicians about ventilator management, and designing guidelines for sedation and analgesia in patients with coronavirus 2019.¹⁰⁻¹²

As of 2018, fewer than 4% of anesthesiologists in the United States had board certification in critical care (data provided by the American Board of Anesthesiology upon the authors' request; data received June 17, 2019). As a comparison, more than 10% were board certified in pain medicine, and 6% were board certified in pediatric anesthesiology, and although low, there has been some growth in in the prevalence of

anesthesiologists who are board certified in critical care in the past 25 years, given that in 1986 fewer than 2% of anesthesiologists had subspecialty certification in critical care, according to the data from the American Board of Anesthesiology. The focus on critical care due to the coronavirus pandemic might further stimulate an interest in board certification in this specialty, given the inspiring roles of anesthesiologists in leading and providing care on the frontlines.¹³⁻¹⁶ This possible surge in demand for fellowship training in adult critical care could be met by the steady growth in fellowship opportunities across the United States.¹⁷

According to statistics from San Francisco Match, the number of critical care fellowships in the United States has grown by 21.3% from 47 programs in 2014 to 57 programs in 2018.¹⁷ The number of fellowship positions offered also has grown accordingly, by 39.3% from 150 positions in 2014 to 209 positions in 2018.¹⁷ This growth also has occurred in adult cardiothoracic anesthesiology, with a 22.2% increase in programs from 54 in 2014 to 66 in 2018.¹⁸ The number of fellowship positions in adult cardiothoracic anesthesiology also has increased by 33.3% from 168 positions in 2014 to 224 positions in 2018.¹⁸ The growing interest in cardiothoracic critical care also may be boosted by the pandemic, thereby encouraging aspiring fellows to train both in critical care and cardiothoracic anesthesiology at a time when capacity is higher than ever before.¹⁹

Recently, we performed an electronic survey of leaders in academic anesthesiology departments in conjunction with the Society of Academic Associations of Anesthesiology and Perioperative Medicine. In this survey, more than 75% (23/30) of respondents noted that a critical care anesthesiologist held a system-wide leadership position at his or her respective institution. These positions included chief operating officer, senior vice president, and chair for critical care medicine in their respective hospitals. Furthermore, all respondents viewed having an anesthesiology presence within adult critical care medicine as positive. Respondents were mixed about the financial implications of anesthesiologists practicing critical care, with

Table 1
Major Themes in the Future of Critical Care

Theme	Typical Examples
Foster trainee interest	<ul style="list-style-type: none"> • “We need more residents interested in the specialty - applicant pool very shallow, inadequate to fill programs.” • “I think there is an increasing demand and we should be encouraging more of our graduates to pursue critical care training.” • “It will be bright if more of our young people participate.”
Expansion into cardiothoracic critical care	<ul style="list-style-type: none"> • “We are the people placing cannulas for extracorporeal membrane oxygenation, and running the cardiothoracic intensive care unit.” • “Critical care anesthesiologists are more in demand than when I graduated, particularly in the cardiothoracic intensive care units.” • “Absolutely with the success in adult extracorporeal membrane oxygenation, we now have nearly 15 intensive care/cardiothoracic anesthesiologists who participate in placement of ECMO cannulas, care for the sickest patients in the hospital, and provide a 24 hour echocardiography service. This is the future of anesthesia.” • “Also anesthesiologists have become the main providers of cardiac surgery critical care and seem to have a unique role in this environment.”
Future practice of anesthesiology	<ul style="list-style-type: none"> • “The future of operating room anesthesia for anesthesiologists is uncertain, but there will always be critically ill patients to care for.” • “Essential, central to the survival of the specialty.” • “Essential to the future of the specialty.” • “I think it is very positive and should be promoted. It helps define all anesthesiologists as doing more than working in the operating room and certainly separates us from others who want to do our jobs providing operative anesthesia.” • “Unlimited potential in academic and private practice.” • “Future is bright, with increasing demand for our services.” • “I personally see a future where more providers are dual anesthesiologist-intensivists.”
Priority for support	<ul style="list-style-type: none"> • “Potentially an expanding presence, but it will require the entire specialty to emphasize the importance of this aspect of training.” • “The balance of power between the departments and departmental

(continued)

Table 1 (continued)

Theme	Typical Examples
Bigger footprint in critical care landscape	<p>leadership support must be fully established to enable secure time in the intensive care unit.”</p> <ul style="list-style-type: none"> • “All anesthesiologists should be critical care physicians.” • “We have to own this.” • “It should be at the forefront of the specialty.” • “We need to increase our presence in the field of critical care to be harmonious with our European colleagues who are the primary providers and leaders in their intensive care units.”

Abbreviation: ECMO, extracorporeal membrane oxygenation.

23.3% (7/30) stating that it required additional financial support, 30% (9/30) stating that it garnered additional revenue, and 46.7% (14/30) having a neutral position. Upon completion of the survey, respondents also described their vision for critical care within anesthesiology. From a total of 23 free text responses, 5 major themes could be defined as follows: further encouragement of resident interest; greater expansion into cardiothoracic critical care; the importance of critical care to the future of anesthesiology; the priority for greater support and recognition; and boosted ownership in critical care medicine by anesthesiologists (Table 1). Notably, a major theme is the ongoing expansion of critical care anesthesiologists into cardiothoracic critical care with concomitant integration of extracorporeal membrane oxygenation into the practice of perioperative medicine.^{13,14}

As the coronavirus crisis continues, the roles of anesthesiologists outside the operating room environment will expand and add value across their health systems. The response to the crisis likely will grow the roles of anesthesiologists in critical care, including the cardiothoracic arena. It will remain important to harmonize this growth with developments in the critical care landscape, including calls for refined training certification requirements.²⁰ Furthermore, there also are opportunities for adult cardiothoracic anesthesiology to learn from the European experience in fellowship development as the evolution in this subspecialty continues.²¹ The challenges ahead for fellowships in adult cardiothoracic anesthesiology include board certification and better integration with cardiothoracic critical care.^{22,23} This dynamic interface between cardiothoracic anesthesiology and critical care offers multiple opportunities for both subspecialties to harmonize, thrive, and strengthen their clinical impact and delivered value.

Conflict of Interest

None.

Acknowledgment

The authors thank the Society of Academic Associations of Anesthesiology and Perioperative Medicine for survey distribution.

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