these ICU models. In my program, the cardiovascular ICU uses the comanaged model. As part of the surgical team, I find morning rounds with the ICU team to be crucial and to allow multiple perspectives to be shared. This allows maximal education and optimal patient care. Studies reporting resident's opinions have shown that residents feel less "out of the loop" and have improved job satisfaction with the comanaged model.² Our program provides several rotations in the cardiovascular ICU dedicated to critical care education throughout our junior resident

years. With these critical care experiences, I believe that we will be able to integrate into a multidisciplinary team taking care of critically ill cardiovascular and thoracic patients and provide optimal critical care.

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EDITORIAL COMMENTARY

Cardiac critical care: Balancing educational goals with optimal patient care

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See related editorial on pages 289-90.

As highlighted in previous reviews, there is a need for an "evolution" in the care of the perioperative cardiothoracic patient.^{1,2} The primary objective of such care should be clinical vigilance to prevent irreversible complications and facilitate timely recovery after a cardiothoracic procedure.³ In his article in this issue of the *Journal*, Encarnacion⁴ has correctly identified some of the pertinent issues related to closed, open, and comanaged models with respect to patient-focused care. While there may be some debate regarding just who should optimally be involved,⁵⁻⁷ there is evidence that a focused multidisciplinary team in specialized units, such as the cardiothoracic intensive care unit (ICU), contribute to the achievement of optimal postoperative care.⁸⁻¹¹

We have previously reported our center's approach to patients after cardiac surgery, which evolved as our institution

changed from a closed, mixed surgical ICU to a dedicated, specialized cardiac surgery "24 hours a day/7 days a week" in-house consultant-comanaged model of care.⁹ With this model of care, we found positive results with respect to decreased need for blood transfusions, reduction in mechanical ventilation, and shortened hospital stay.^{8,9} Encarnacion⁴ has also, however, identified an equally important issue, that of determining which ICU physician staffing model is most beneficial with respect to cardiothoracic trainee experience. Whereas previous reports may have identified an ICU physician staffing model that can optimize patient care, that model was not necessarily created with the trainee acting as an essential part of the multidisciplinary team.

Encarnacion's comments also raise the issue of the ideal residency training model to allow future cardiac surgeons to be competent in both the intraoperative and perioperative aspects of patient care.⁴ In "traditional" training programs, after the completion of a general surgery residency, an individual would then complete a cardiothoracic fellowship. During this 2- to 3-year period, the individual would have to become "competent" in adult and pediatric cardiac surgery in addition to thoracic surgery. It is clear that there is the potential for very little time to focus on perioperative cardiac care. In Canada, the "integrated" cardiac training program, in which individuals enter the 6-year cardiac surgery stream after medical school, has been a successful model of training

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for almost 2 decades. With the development of similar training programs in the United States, this model may permit adaptive focused training on all aspects of surgery and cardiac critical care throughout the duration of residency.

As such, in the evolution of the cardiothoracic ICU to optimize patient care, it is important that we do not lose sight of the need to train competent health care providers for the future. Today's typical cardiothoracic patient often has significant comorbid disease and a higher level of frailty. As this baseline patient vulnerability combines with the increasing complexity of cardiothoracic interventions a trainee must master, training centers will need to balance optimal patient care with resident and fellow education as a whole, including critical care training. Training centers may need to consider which ICU physician staffing model of care permits the optimal mentor–trainee exposure for cardiothoracic surgical residents from either traditional or integrated training programs.

Encarnacion's review serves to highlight the potential challenges for current trainees to develop an in-depth understanding of the perioperative care of the contemporary cardiothoracic patient.⁴ It is now up to the training programs to consider the balance between the long-held tradition of service for education and resident autonomy against patient beneficence and nonmaleficence to ensure optimal care for the cardiothoracic patient.

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