

Society for the Advancement of Transplant Anesthesia: Liver Transplant Anesthesia Fellowship—White Paper Advocating Measurable Proficiency in Transplant Specialties Training

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Abstract

The anesthesia community has openly debated if the care of transplant patients was generalist or specialist care ever since the publication of an opinion paper in 1999 recommended subspecialty training in the field of liver transplantation anesthesia. In the past decade, liver transplant anesthesia has become more complex with a sicker patient population and evolving evidence-based practices. Transplant training is currently not required for accreditation or certification in anesthesiology, and not all anesthesia residency programs are associated with transplant centers. Yet there is evidence that patient outcome is affected by the experience of the anesthesiologist with liver transplants as part of a multidisciplinary care team. Requests for a formal review of the inequities in training opportunities and requirements led the Society for the Advancement for Transplant Anesthesia (SATA) to begin the task of developing post-graduate fellowship training recommendations. In this article, members of the SATA Working Group on Transplant Anesthesia Education present their reasoning for specialized education and conclusions about which pathways can better prepare trainees to care for complex transplant patients.

Keywords

post graduate medical education, transplantation, anesthesiology, accreditation, practice guidelines

Medical specialization is a period of additional training that allows physicians expand their skill sets within a focused area of practice. The purpose is to deliver comprehensive quality care to their patients. The American Board of Medical Specialties, a nongovernmental agency, was developed to certify post-graduate medical training programs in specific areas of practice such as anesthesiology.¹ The American Board of Medical Specialties is a member of the Accreditation Council for Graduate Medical Education. The latter accredits medical training programs—a process required for Medicare graduate medical education funding and to receive certification in a specialty or subspecialty.

The purpose of this nongovernment oversight is to maintain institutional standards that promote educational quality and help situate specialty education in an environment that promotes patient safety and professionalism

among trainees. Accreditation aims to protect trainees and assure the public that graduates of specialty and subspecialty programs are proficient to engage in independent practice.² It is interesting to note that not all post-graduate

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specialty-training programs are accredited. In the United States, most nonaccredited fellowship programs are still administered by each institution's Graduate Medical Education Committee as opposed to the American Board of Medical Specialties.³ Each institution is responsible for aligning the conduct of nonaccredited training programs with those that are accredited.

Organization of a Working Group for Transplant Anesthesiology Fellowship Recommendations

To date, there are no nationally accepted training pathways to attain proficiency in liver transplant anesthesia practice. Decisions about liver transplant anesthesia practices were previously made by the American Society of Anesthesiologists, which represents the interests of all anesthesiologists and are similar in breadth to the American College of Surgeons. Requests by the anesthesia community for access to in-depth training in specific areas of practice led to the formation of specialist societies such as the Society for the Advancement of Transplant Anesthesia (SATA), a US-based organization with an international membership.⁴

SATA has undertaken the task of developing training recommendations for anesthesia transplant specialties in order to facilitate more consistent and evidence-based education. The executive board of SATA put forth a motion to support fellowship training in transplant anesthesia. The membership voted to support the motion. In response, the Society appointed members of their standing Fellowship and Vanguard Committees to form a working group to develop training recommendations. Anesthesiologists with various levels of experience were included in the working group to obtain diverse perspectives on post-graduate liver transplant anesthesia training. This article contains consensus opinions from the working group and supporting evidence about why additional training in the transplant anesthesia specialties is a first step in ensuring quality in delivery of care. The article outlines the principle considerations the working group used to decide on the choice of pathways to develop proficiency in transplant anesthesia specialties.

Subspecialty Practice in Anesthesiology

The field of anesthesiology is growing and diversifying on a daily basis. There are a number of accredited anesthesia subspecialties where trainees can obtain certification. These training programs were designed to provide physicians with additional education, skill sets, and experience not routinely required for successful certification by the

American Board of Anesthesiology. Similarly, a number of nonaccredited fellowships are routinely available that also aim to provide training that cannot always be obtained during an anesthesiology residency. One of the benefits of a nonaccredited fellowship is flexibility in program design. Educational curricula can be modified to suit the needs of the individual while maintaining standards administered by the Graduate Medical Education Committee of each institution. To date, transplant anesthesia has chosen not to pursue an accreditation pathway in order to preserve individuality and flexibility in training program development.

Liver Transplant Anesthesiology

The field of liver transplant anesthesia is a relatively new area of practice, which has fallen within the scope of general anesthesia. Currently, no additional training is required for patient care. Using liver transplant anesthesiology as a basis, the working group articulated important reasons that specialty training should be considered. Anesthesia care of liver transplant recipients is increasingly complex. Furthermore, the care of these patients is guided by modern evidence-based quality practices that are not included in all training programs. More advanced skill sets are needed to care for a patient population where severity of patient illness continues to increase.⁵

Knowledge and experience requirements for certification in anesthesiology are limited to more common clinical practices. Resident experience with transplant patients varies since a number of anesthesia training programs do not have liver transplantation programs and resident participation may vary at those that do have active programs. Since the perioperative care of transplant patients is provided by a multidisciplinary approach similar to critical care medicine, the education of transplant anesthesia fellows requires a more integrated pathway than is customarily provided by residency. Furthermore, an important issue expressed by anesthesiologists is a desire for greater representation in national discussions and policymaking by governing agencies regarding organ transplantation. Members of the anesthesia community thought this would be facilitated if transplant anesthesiology was a recognized subspecialty.⁵

Survey data shows that anesthesiologists often enter liver transplant practice from other accredited fellowships including critical care or cardiothoracic anesthesia.⁶ Fellows in both specialties develop skills to care for critically ill patients. This furnishes graduates with an advanced skill set that can be adapted to liver transplant anesthesiology. However, these subspecialties do not directly prepare trainees to care for liver transplant patients and are not equivalent to training in a fellowship that focuses on transplantation.

Liver Transplant Anesthesiology: Generalist or Specialist Practice?

As early as 1999, members of the transplant community debated if liver transplant anesthesiology should be performed by specialist or general anesthesiologists.⁷ The issues driving the question of subspecialization were previously theoretical. The benefits of subspecialization became evident after investigators reported that an anesthesiologist's experience affected resource utilization, patient morbidity and mortality. Multiple studies showed that a dedicated team of anesthesia transplant experts highly influenced the amount of blood transfusion, number of laboratory tests performed, time of postoperative ventilation, length of intensive intensive care unit (ICU) stay, and the rate of postoperative complications.⁸⁻¹⁰ In 2015, a single center study clearly linked an anesthesiologist's experience to a significant difference in perioperative liver transplant recipient mortality.¹¹ Of note, there was sufficient evidence for the Organ Procurement and Transplantation Network/United Network for Organ Sharing (OPTN/UNOS) to ratify a bylaw in 2011 requiring all centers appoint a Director of Liver Transplant Anesthesia.¹²

Training Pathways for Liver Transplant Anesthesiology

The OPTN/UNOS bylaws specified a set of criteria defining the position of Director of Liver Transplant Anesthesia including type of training, case volume, and continuing education.^{12,13} This was the first recognition by a national governing body of the importance of specific training pathways in the field of liver transplant anesthesia. The requirements listed were consistent with aspects of practice that fall under the auspices of accreditation organizations.

Entry of ICU and cardiac anesthesia specialists into the field of liver transplantation was supported by the OPTN/UNOS bylaws that define the position for Director of Anesthesia for Liver Transplantation. However, these training pathways were included in the 2014 recommendations due to concerns that centers would not be able to identify Directors with specific liver transplant training. Therefore, trainees who cared for sicker patients were considered equivalent to individuals who received subspecialty training in liver transplantation anesthesia. The SATA working group endorses specific liver transplant anesthesiology training and suggests that recommendations consider an abbreviated transition training period for accredited ICU and cardiac fellows.

Transplant Fellowship Recommendations

The initial focus of the SATA working group was liver transplant anesthesia training since this has been a

highly debated topic in the field of anesthesiology. However, working group members agreed that all types of transplant anesthesia training would benefit from a single set of recommendations that can be adapted for each organ system. Therefore, the working group developed a broader framework that could be used to design specific recommendations for organ systems included in transplant anesthesia. Satellite working groups of experts are currently being appointed to adapt the broader transplant recommendations to each organ system. The working group pointed out that the organ-specific training pathways could then be used as building blocks for unique combinations of transplant anesthesia training at each institution.

Existing Transplant Anesthesiology Fellowships

The working group began by contacting centers in the United States and Canada with liver transplant anesthesia fellowship programs to collect information about the nature and content of current training programs. The aim was to identify commonalities between programs and understand what activities trainees valued most. The questionnaire is presented in Table 1. A total of 16 fellowship programs were identified.

In most programs (10/16), fellows participated in transplant patient care as a trainee, while performing in the role as a junior faculty part-time. There were a mixture of teaching faculty with a variety of subspecialty training performing transplant anesthesiology. More than half of the faculty at these 16 centers completed anesthesiology fellowships in cardiothoracic, critical care, and transplantation. Other faculty involved in training had no fellowship experience and did not have to meet any criteria for specialty teaching. All programs offered electives, but these rotations varied. Rotations in ICU, blood bank, transesophageal echocardiography, and hepatology were most common. Programs also varied markedly in their emphasis on research, as only 9 of 16 provided dedicated time.

There was more consistency in the educational content and clinical expectations of the fellowship programs. All fellowship programs expected trainees to participate in institutional selection committees, multidisciplinary morbidity and mortality rounds, and preoperative evaluation. All programs set case volume expectations for their trainees, although these varied between programs. These findings reinforced the importance of developing training recommendations that could be easily modified to meet the needs of individual trainees. However, the data also suggested that the fellowship structural organization, educational content, and case volume recommendations needed more consistency and

Table 1. Survey of Liver Transplant Anesthesiology Fellowships.

1. How many fellows do you have yearly?
2. What year did the fellowship start?
3. Do you recruit US candidates, international, or both?
4. How many liver transplants do you do as a center yearly?
5. How many liver transplant on average does a fellow do?
6. If your center does pediatric liver transplants, is there an age cutoff?
7. How many faculty are on your liver transplant team, and if so what are their fellowships?
8. Do your fellows get dedicated attending time, if so, how many days per week?
9. What cases are the responsibility of a fellow in the operating room? (transplants only, or other categories like major hepatobiliary, major vascular, etc)
10. Do your fellows get dedicated research time, if so, how many days?
11. Do your fellows use intraoperative transesophageal echocardiography (TEE)? If so, for how many cases yearly?
12. How many members of your transplant faculty have TEE certification? Is it Basic or Advanced?
13. Is one of the goals of your fellowship Basic TEE certification?
14. Do your fellows use viscoelastic testing (ROTEM or TEG) at your institution?
15. What rotations are offered to a fellow outside of the operating room?
16. Do your fellows attend the liver transplant selection committee?
17. Do your fellows attend a preoperative clinic for liver transplant patients?
18. Are publications required as part of your fellowship?
19. Are any presentations required as part of the fellowship? (M/M, journal club, etc)
20. Do you have any designated lectures by faculty as part of your fellowship or recommended reading?
21. Are your fellows involved in any simulation for liver transplant?
22. Are your fellows involved in any donor procurement?

could benefit from the development of recommendations by a representative society.

Recommendations by the SATA Working Group

The committee concluded that SATA fellowship recommendations should have similar organization to other accredited transplantation subspecialties. Therefore, the working group chose the 2016 American Society of Transplant Surgeons fellowship guidelines as a general template to organize anesthesia liver transplant fellowship training programs.¹⁴ Specific areas addressed were (1) using core competencies to guide training and

milestones to assess proficiency, (2) training conducted by faculty with skill sets consistent with specialized transplant knowledge, (3) the presence of a transplant fellowship director, (4) a minimum number of cases performed by the trainee, (5) program case volume, and (6) confirming programs are in compliance with requirements defined by outside regulatory bodies including Centers for Medicare and Medicaid and OPTN/UNOS. The SATA working group also recommended that fellowship programs in liver transplantation have a Director of Liver Transplant Anesthesia who meets OPTN/UNOS bylaw criteria.

The decision to use core competencies and milestones was based on evidence that these are effective educational tools to follow the development of proficiency for trainees. The working group agreed to use the ACGME Adult Cardiothoracic Anesthesiology Milestone Project for guidance when developing milestones specific for transplant anesthesiology.¹⁵ The purpose of this article was to explain the decision by SATA to advocate for training that addresses the rapidly growing need for skilled transplant anesthesiologists and to outline a standardized and validated approach to the post-graduate preparation of anesthesiologists to care for transplant patients. At the current time, members of SATA are actively working to complete the recommendations for anesthesiology core competencies and milestones for each particular organ, which will be published in future articles.

Conclusions

The executive board of SATA concluded fellowship training will help build transplant anesthesia as a recognized field of subspecialty practice. They anticipate that the use of better and recognized training pathways will help populate the anesthesia transplant organ-specific specialties with providers who have reached uniform and objective measures of proficiency. The SATA board of executives supports the opinions and the plans presented by the working group. The Society concluded that well-defined training pathways are an important step in serving the best interest of patient care and will produce a visible and recognized subspecialty to help enlist new trainees.

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