

Pediatric Anesthesiology Fellowship Positions: Is There a Mismatch?

Franklyn P. Cladis, MD, FAAP,* Justin L. Lockman, MD, MSED,† M. Concetta Lupa, MD,‡ Debnath Chatterjee, MD, FAAP,§ Doyle Lim, MD, MMM, FAAP,|| Michael Hernandez, MD,¶ Samuel Yanofsky, MD, MSED,# and William B. Waldrop, MD**

GLOSSARY

ACGME = Accreditation Council for Graduate Medical Education; **DIO** = Designated Institutional Officer; **GME** = graduate medical education; **NRMP** = National Resident Matching Program; **PAPDA** = The Pediatric Anesthesiology Program Directors' Association

For the fifth year in a row, the percentage of unfilled programs in the Pediatric Anesthesiology Fellowship National Resident Matching Program (NRMP) has increased. In the 2019 Match last October, 42% of the programs did not fill their fellowship positions, up from 10% in 2015 (<https://mk0nrmpcikgb8jxyd19h.kinstacdn.com/wp-content/uploads/2019/02/Results-and-Data-SMS-2019.pdf>). Specifically, 15 Pediatric Anesthesiology Fellowship programs did not fill a single fellow position, whereas 9 programs were left with 1–3 empty positions at the end of the Match. Pediatric anesthesiology fellowship applicants did very well: nearly 98% of them found a position through NRMP. By way of comparison, pain and cardiac had virtually no unfilled programs (3% of pain fellowship programs were unfilled that same year through NRMP).

Understanding the history of pediatric anesthesiology training and its relationship with the Accreditation Council for Graduate Medical Education (ACGME) and NRMP in the United States is important in order to appreciate the current

position to applicant trends. In 1997, through the work of Dr Mark Rockoff and the “Gang of Seven,” pediatric anesthesiology became an ACGME-accredited fellowship. At that time, there were approximately 45 training programs and a total of 100 fellows.¹ The number of training programs did not considerably change until 2013. Importantly, this is also the first year the American Board of Anesthesiology offered the subspecialty certification examination in pediatric anesthesiology. Since then, there has been a steady increase to a current total of 60 ACGME-accredited programs. More striking than the increase in training programs has been the increase in fellowship positions. Since the late 1990s, there has been a 150% increase in positions, from approximately 100 to 259. Although there has been a more modest increase in the number of trainees applying to pediatric anesthesiology, it has been outpaced by the increase in fellowship positions. The result is significantly more fellowship positions than applicants—and, not surprisingly, an increase in unfilled positions. This rapid rise in training positions has significant consequences for fellowship selection, Match viability, and possibly the future workforce of pediatric anesthesiologists. These concerns are outlined below.

Regarding selection, in 2018, the applicant-to-position ratio in the Match crossed an important threshold: <1. The ratio of applicants to fellowship positions in the 2018 Match was 0.86, suggestive of an oversupply of fellowship positions, and this trend continued downward to 0.83 for 2019. More important than the oversupply of positions, 97.8% (180 of 184) of the applicants matched into a program. In short, there are not enough applicants in the Match to fill all of the positions placed in the Match, and nearly all of the applicants find a position. The oversupply of training positions is not unique to pediatric anesthesiology. There were 66 fellowships offered through NRMP for 2019 for both adult and pediatric specialties, and nearly half (32) of the programs had an applicant-to-position ratio <1 (<https://mk0nrmpcikgb8jxyd19h.kinstacdn.com/wp-content/uploads/2019/02/Results-and-Data-SMS-2019.pdf>). The average applicant-to-position ratio for these 32 programs was 0.7. What differentiates our specialty is that we accept nearly all of the applicants. Only 2 of the 32 programs with

From the *Department of Anesthesiology and Perioperative Medicine, UPMC Children's Hospital of Pittsburgh, Pittsburgh, Pennsylvania; †Department of Anesthesiology and Critical Care Medicine, The Children's Hospital of Philadelphia, Perelman School of Medicine at The University of Pennsylvania, Philadelphia, Pennsylvania; ‡Department of Anesthesiology, University of North Carolina Children's Hospital, Chapel Hill, North Carolina; §Department of Anesthesiology, Children's Hospital Colorado/University of Colorado, Aurora, Colorado; ||Department of Anesthesiology, Thomas Jefferson University, Nemours AI Dupont Children's Hospital, Wilmington, Delaware; ¶Department of Anesthesiology, Critical Care and Pain Medicine, The Children's Hospital Boston, Boston, Massachusetts; #Department of Anesthesiology and Critical Care Medicine, Children's Hospital of Los Angeles, Los Angeles, California; and **Department of Anesthesiology, Perioperative and Pain Medicine, Texas Children's Hospital, Baylor College of Medicine, Houston, Texas.

Accepted for publication July 23, 2019.

Funding: None.

The authors declare no conflicts of interest.

Reprints will not be available from the authors.

Address correspondence to Franklyn P. Cladis, MD, FAAP, Department of Anesthesiology and Perioperative Medicine, UPMC Children's Hospital of Pittsburgh, 4401 Penn Ave, Pittsburgh, PA 15224. Address e-mail to cladfp@upmc.edu.

Copyright © 2019 International Anesthesia Research Society

DOI: 10.1213/ANE.0000000000004431

applicant-to-position ratios <1 had an applicant match rate as high as pediatric anesthesiology, 97.8%. These data suggest that there may be impaired selectivity in our admissions process. In other words, practically any resident interested in becoming a pediatric anesthesiologist is likely to be accepted into a pediatric anesthesiology fellowship. This does not necessarily mean unqualified applicants are being accepted into fellowships. However, it does mean that we may be ranking and matching less competitive ones.

The pediatric anesthesiology Match is in crisis, but the Match should not be a reflexive casualty. Pressure placed on program directors by department chairs, hospital graduate medical education (GME) leaders, and others to fill all available training positions validates the mistaken notion that unfilled positions are a reflection of a poor training program. This pressure is unnecessary and misplaced. Positions will be unfilled in the current situation, and it is not a reflection of the quality of a program, but rather a reflection of the mathematics of the Match. Unfilled programs will continue to exist in future Match cycles unless an appropriate method to regulate training positions is devised. These are difficult times for pediatric anesthesiology programs trying to attract talented fellows. The recent issues have led some to suggest the dissolution of the Match for pediatric anesthesiology. This will not solve the problem. It will only further burden applicants. The Pediatric Anesthesiology Program Directors' Association (PAPDA) engaged NRMP to initiate the Match on behalf of resident applicants 6 years ago. The Match is designed to make the application process fairer and less coercive. Eliminating the Match will only reintroduce a system that is designed to favor training programs over the applicant.

A recent workforce analysis by Muffly et al² suggests that if we continue our current growth in training programs, we may produce too many pediatric anesthesiologists. Muffly et al² demonstrated that by 2035, there may be a 50% increase in the number of pediatric anesthesiologists without a similar increase in demand.² The pediatric population is projected to remain flat during the next 20 years, and the number of in-patient surgical procedures is also projected to be unchanged over the next 2 decades. Although long-term workforce analyses are prone to risk, it is worth considering that Muffly et al's² data suggest that we may be training too many pediatric anesthesiologists. Oversupply of pediatric anesthesiologists may dilute an anesthesiologist's clinical experience by producing a segment of the pediatric workforce that does not predominantly take care of pediatric patients. This poses challenges for maintaining proficiency in pediatric skills that are required for extremes of age and medical complexity. The volume of pediatric anesthetics delivered by a pediatric anesthesiologist appears to have an impact on outcomes.^{3,4} Any efforts to regulate fellowship positions must be done with an appreciation and understanding of the market forces that may impact the supply of and demand for these positions nationally.

What has driven this increase in training programs and positions? Is it the prestige of having a pediatric fellowship that now leads to subspecialty certification? Is it the desire to have more of a presence of fellow-level

physicians for pediatric patients in training programs? Is it to build future consultants for our specialty? Is it to provide a supply of fellowship-trained consultants to underserved areas? Or is it to provide less expensive staffing for our operating rooms? Maybe it is a combination of these and other factors. It is less costly to train a fellow than to hire one or more anesthesia physician extenders.⁵ One concerning possibility is that the expansion of fellowship positions has been fueled by departmental economics rather than an analysis of future workforce needs and optimal educational experience.

The pediatric anesthesia community is at a crossroads. What should be our response to this overabundance of training positions? We believe we should continue with the Match. The Match is designed to make the application process fairer for applicants, and it should stay. The historical process of rolling admissions is designed to benefit fellowship programs and makes the selection process more unfair for applicants.

We also believe that chairs, chiefs, and GME leaders (Designated Institutional Officers [DIOs]) should not place undue pressure on program directors to alter their selection process to fill their fellowship positions for the sake of filling. The pressure to fill is understandable. There is a fiscal and service responsibility placed on departmental leadership to fulfill their clinical responsibilities. However, if the mission of the fellowship is to develop high-quality consultants that will advance the specialty, then there needs to be a selection process that is free from this pressure.

The crucial question is whether we are we at a point where we need to regulate the number of fellowship programs and positions nationally. Does it matter? We think it does matter. We believe the pediatric anesthesiology specialty needs to begin to regulate the number of pediatric anesthesiologists produced every year. This is not an easy task, and it creates more questions than answers. What are the appropriate metrics to determine the correct number of fellowship programs and positions, and what organization should govern this process? Neither ACGME nor NRMP are in the business of regulating the number of training positions. If we look to other specialties, we find that there is no clear road map to achieve this regulation. The rare specialty that has achieved some form of regulation accomplishes this through a personalized approach that fits the organizing structure and needs for that specialty. These agreements may be both formal and informal, and they tend to be in fellowships that have a smaller number of programs. They also have top-down support from chairs, chiefs, and program directors. There are consequences for getting this wrong, and there are consequences for doing nothing. We, as a community of pediatric anesthesiologists, need to have this conversation, and we should begin the process of regulating ourselves. How this process occurs is not clear, but it is clear that this issue is important to our future fellows, colleagues, training programs, and the specialty. ■■

DISCLOSURES

Name: Franklyn P. Cladis, MD, FAAP.

Contribution: This author helped write and edit the manuscript.

Name: Justin L. Lockman, MD, MEd.

Contribution: This author helped write and edit the manuscript.

Name: M. Concetta Lupa, MD.

Contribution: This author helped write and edit the manuscript.

Name: Debnath Chatterjee, MD, FAAP.

Contribution: This author helped write and edit the manuscript.

Name: Doyle Lim, MD, MMM, FAAP.

Contribution: This author helped write and edit the manuscript.

Name: Michael Hernandez, MD.

Contribution: This author helped write and edit the manuscript.

Name: Samuel Yanofsky, MD, MEd.

Contribution: This author helped write and edit the manuscript.

Name: William B. Waldrop, MD.

Contribution: This author helped write and edit the manuscript.

This manuscript was handled by: Edward C. Nemergut, MD.

REFERENCES

1. Rockoff MA, Hall SC. Subspecialty training in pediatric anesthesiology: what does it mean? *Anesth Analg.* 1997;85:1185–1190.
2. Muffly MK, Singleton M, Agarwal R, et al. The pediatric anesthesiology workforce: projecting supply and trends 2015-2035. *Anesth Analg.* 2018;126:568–578.
3. Auroy Y, Ecoffey C, Messiah A, Rouvier B. Relationship between complications of pediatric anesthesia and volume of pediatric anesthetics. *Anesth Analg.* 1997;84:234–235.
4. Zgleszewski SE, Graham DA, Hickey PR, et al. Anesthesiologist- and system-related risk factors for risk-adjusted pediatric anesthesia-related cardiac arrest. *Anesth Analg.* 2016;122:482–489.
5. Ferrera MH, Beaman ST, Metro DG, Handley LJ, Walker JE Jr. What is an anesthesiology resident worth? *J Clin Anesth.* 2009;21:317–321.