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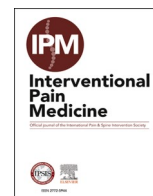
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Commentary

A sudden shift for Pain Medicine fellowships – A recount of the 2024 match

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ABSTRACT

Pain Medicine, a field that was once considered primarily a specialty of opioid medication management, evolved into a multimodal care model with the goal of limiting reliance on pain medications. Now, we see another revolution—the advancement from percutaneous procedures to minimally invasive surgical procedures.

Despite these changes, Pain Medicine fellowships have consistently been recognized as a competitive subspecialty with more applicants than the number of available positions – until now. The most recent pain fellowship match suggests an abrupt change to the popularity of the specialty (with over 61 unmatched positions and over 35 unfilled programs) for applicants expected to matriculate in the year 2024 [1]. Unfilled positions have risen from 5% to 15% in the past three years. Similarly, unfilled programs have risen from 10% to 30% in the past three years.

Several reasons for this sudden change in popularity have been proposed, including a lucrative general anesthesiology market, increasing difficulties with insurance coverage and reimbursement for procedures, and a dearth of advanced pain procedures performed at academic medicine programs. The field is at a critical juncture, necessitating ongoing discussions and collaboration among stakeholders to ensure that trainees are attracted to this dynamic field and are ultimately equipped to meet the evolving needs of patients.

1. Creation of the field of Pain Medicine

Pain is one of the oldest recognized medical conditions, and it varies across a broad spectrum of cultures and civilizations [2]. Despite the scientific and historical origins of Pain Medicine beginning in the 1800s, the first formalized training program was created in 1978 [3]. Little is known about the state of academic pain education from 1978 until the late 1980s. During this time, pain education was thought to follow an apprenticeship model without a formal curriculum of integrated educational experience [4].

Initial discussion regarding the creation of certified pain fellowships began in 1989. Leaders within the American Society of Anesthesiologists and the American Society of Regional Anesthesia and Pain Medicine sent correspondence to the American Board of Anesthesiology (ABA) calling for a certification process for anesthesiologists in Pain Medicine [4]. Interestingly, the American Board of Medical Subspecialties (ABMS) had received multiple requests to establish Pain Medicine as a subspecialty, raising concerns that Pain Medicine would become fragmented among multiple specialties [5].

Given these concerns, the ABA spearheaded the initiative to house Pain Medicine within the specialty of anesthesiology by applying to the ABMS in January 1991. The application was approved in March 1991, creating a path for the Accreditation Council of Graduate Medical Education to create program requirements and the ABA to create a certification examination. The ACGME first included Pain Medicine fellowships amongst its list of accredited programs starting in 1993. Since then, the number of Pain Medicine fellowships has grown from 55 programs to 114 programs [6]. Furthermore, there has been an increase of 10.6% in Pain Medicine fellowship programs in the last five years [6].

While anesthesia was home to the initial Pain Medicine fellowships, Pain Medicine training developed into a multidisciplinary specialty over time. In 2002, the American Board of Psychiatry and Neurology and the American Board of Physical Medicine and Rehabilitation worked with the ACGME to emphasize the field's multidisciplinary nature and act as four sponsoring specialties of Pain Medicine fellowship programs [3].

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2. Changes in Pain Medicine fellowship training over the years

The multidisciplinary composition of Pain Medicine physicians led to the advocacy of a comprehensive curriculum (Table 1). During this period, the clinical treatment of pain was also changing from an emphasis on opioids to treat chronic pain conditions to: the use of nonopioid pharmacological treatments, the expansion of the biopsychosocial model, and interventional treatments [4]. The use of advanced interventional therapies expanded rapidly, with estimates of an over 180% increase in spinal injections per 100,000 Medicare beneficiaries [7].

The next significant change to pain fellowship training came in 2013 with the creation of a Pain Medicine fellowship match with the National Resident Matching Program (NRMP) led by the Association of Pain Program Directors (APPD). Then, in 2017, the Department of Health and Human Services (HHS) declared a public health emergency to address the national opioid crisis. This resulted in the Opioid Workforce Act of 2021, which funded up to 1000 new Medicare-supported training positions. As a result, the number of fellowship programs and positions continued to expand, with the most recent data from 2022 reporting 409 available pain fellowship spots at 110 programs [6].

While many of the demographics of Pain Medicine trainees have remained relatively stable over the past decade, there have been some notable changes. The number of female pain fellows has increased from a ratio of 5:1 to 3.7:1 from 2009 to 2021 [8]; yet, there is still a sizeable male predominance, with 77.4% of Pain Medicine fellows identifying as male in 2021 [9]. There also continues to be a discrepancy between the number of black (4.4%) and Hispanic (6.3%) pain trainees compared to the United States population of Blacks (13.5%) and Hispanics (18.3%) [6].

Throughout these evolutions, Pain Medicine fellowship was consistently recognized as a competitive subspecialty with more applicants than the number of available positions — until now [10]. The most recent pain fellowship match suggests an abrupt change to the popularity of the specialty, with over 61 unmatched positions and over 35 unfilled programs for applicants expected to matriculate in the year 2024 [1]. (Table 2) Unfilled positions have risen from 5% to 15% in the past three years. Similarly, unfilled programs have risen from 10% to 30% in the past three years. Lastly, unmatched applicants decreased from 15% to 7.5% in the past three years. Applicants per position had been stable from 2019 to 2023, ranging from 1.1 to 1.2 applicants per position. For the 2023–2024 match cycle, it decreased to 0.9 applicants per position [1].

An intriguing point emerged regarding the potential influence of anesthesia residents on driving this trend. To explore this further, the authors obtained a special report from the American Association of Medical Colleagues (AAMC) to illuminate the situation, analyzing raw applicant number data spanning from 2019 to 2023 (Table 3). Noteworthy findings revealed a significant decline in the anesthesia applicant pool from 2022 to 2023, marking a notable decrease of 48.2%. This

Table 1

The expansion of American board of medical specialties (ABMS) accredited fellowship training in pain medicine.

Specialty	Governing Board	Year
Anesthesiology	American Board of Anesthesiology	1992 (initial accreditation)
Neurology	American Board of Psychiatry and Neurology	1998
Psychiatry	American Board of Psychiatry and Neurology	1998
PM&R	American Board of Physical Medicine and Rehabilitation	2003
Family Medicine	American Board of Family Medicine	2003
Emergency Medicine	American Board of Emergency Medicine	2014
Radiology	American Board of Radiology	2015

Table 2

Applicant and Match data regarding Pain Medicine Applicants and Programs [11].

<i>Pain Medicine ERAS Data</i>					
Match Year	2019	2020	2021	2022	2023
Total Applicants	520	514	540	548	446
US Graduates	418	407	432	449	366
International Graduates	102	107	108	99	80
<i>Pain Medicine NRMP Data (“The Match”)</i>					
<i>Applicants</i>					
Applicants Participants	430	395	428	415	359
Applicants Matched	361	337	362	358	332
Applicants Unmatched	69	58	66	57	27
<i>Positions</i>					
Positions Available	367	349	378	377	393
Unfilled positions	6	12	16	19	61
<i>Programs</i>					
Filled program, %	95.1	90.2	89.9	89.1	69.9
Number of Programs	104	102	109	110	115
Programs Unfilled	5	10	11	12	35

Note: Electronic Residency Application Service (ERAS), National Resident Matching Program (NRMP), United States (US).

Table 3

ERAS fellowship applicants to pain medicine by GME residency specialty (courtesy of AAMC).

GME Residency Specialty	Match Year				
	2019	2020	2021	2022	2023
Anesthesiology	351	303	302	293	193
Physical Medicine and Rehabilitation	101	124	131	141	134
Neurology	22	13	11	19	17
Emergency Medicine	10	19	20	26	29
Family Medicine	7	5	11	8	10
Psychiatry	4	6	8	5	6
Radiology-Diagnostic	1	2	2	1	0
Internal Medicine	6	7	8	3	5
Child Neurology	0	1	0	1	1
Osteopathic Neuromusculoskeletal Medicine	0	0	0	1	1
Otolaryngology	1	0	0	0	0
Public Health and General Preventive Medicine	0	1	0	1	0
Occupational and Environmental Medicine	0	0	1	0	0
Surgery-General	0	0	4	2	1
Urology	0	1	0	0	0
Sleep Medicine	0	0	1	1	0
Internal Medicine/Emergency Medicine	0	0	1	0	0
Internal Medicine/Psychiatry	0	1	0	0	0
Pediatrics/Anesthesiology	0	1	0	0	0
Internal Medicine/Anesthesiology	1	0	1	0	1
Transitional Year	0	1	4	6	5
Unknown Specialty	16	29	35	40	43
Total Applicants to Pain Medicine (Multidisciplinary)	520	514	540	548	446

Note: GME residency specialty represents the most recent residency specialty an individual was reported in, regardless of the GME year.

downturn is particularly striking considering that even in 2022, the pool had exhibited a slight decline compared to the preceding years of 2019–2021. Conversely, amidst the fluctuations observed in anesthesia applicants, the data underscored the consistent nature of psychiatry applications, which demonstrated minimal variation from 2019 to 2023.

It should be emphasized that ERAS (Electronic Residency Application Service) handles the submission of application materials for residency and some fellowship programs, attracting a higher number of applicants. However, during the matching process managed by NRMP (National Resident Matching Program), applicant numbers are lower than ERAS numbers due to attrition, including changes in career plans or lack of interviews, resulting in a smaller pool of applicants compared to

those initially applying through ERAS.

3. Sudden change in popularity of the specialty

The performance in the NRMP Match rattled the Pain Medicine community, as evidenced by a social media post describing the recent match data, which garnered over 10,000 views [12]. Some program directors speculated that this change might be secondary to fewer anesthesia applicants applying for Pain Medicine fellowships, given the current strong job market for anesthesia. Other program directors suspected it might be due to applicants' concern about the increasing difficulties with insurance authorizations for interventional pain procedures.

Moreover, with ongoing threats from insurance companies reducing reimbursement and placing more barriers to pre-approval for percutaneous procedures [13], [-] [15] the field's status quo may not be sustainable. Pain Medicine applicants may be hearing the echoes of these insurance issues and, as a result are not applying, or those who do apply are explicitly inquiring about "advanced" procedure case volume with the hope that insurance coverage and reimbursement are better. These advanced procedures include spinal cord stimulation (SCS), dorsal root ganglion stimulation (DRG-S), peripheral nerve stimulation (PNS), intrathecal pumps (ITP), basivertebral nerve ablation, percutaneous image-guided lumbar decompression (PILD), indirect lumbar decompression with interspinous spacers, vertebral augmentation, sacroiliac joint fusion, endoscopic surgical approaches, and percutaneous lumbar fusion techniques.

4. Fellow interest in advanced therapies

Traditionally, ACGME-accredited pain fellowship programs have strived to provide comprehensive curricula focusing on multidisciplinary approaches to managing pain, including medications, physical therapy and rehabilitation, psychological intervention, percutaneous interventions, complementary and alternative therapies, and mind-body approaches. Percutaneous procedures emphasized imaged-guided neuraxial injections, peripheral nerve blocks, and radiofrequency ablation techniques. ACGME-accredited fellowships have a long history of teaching these therapies in a multidisciplinary environment.

However, the newly shifted focus on advanced interventional therapies is palpable; it is evident at societal meetings, cadaver training labs, educational webinars, and year-long fellow training programs. With the unprecedented number of procedures and device companies, there has been a shift from conservative treatments to surgically-based therapies. These companies emphasize early adoption, fellow access, and direct consumer marketing. To achieve these goals, social media has become a platform to disseminate data, promote skills training, announce new approvals and indications, and deliver a narrative often voiced by key opinion leaders and consultants. In keeping with this trend, Pain Medicine applicants focus on the availability of these therapies in prospective fellowships.

5. The need for standardization and change in training

Although consensus guidelines and formal curricula have been established for interventional therapies like SCS, PNS, and ITP [16], [-] [18] newer MIS therapies lack this. Furthermore, ACGME has minimal requirements for training in basic procedures (epidurals, radiofrequency ablation) but no other guidance about neuromodulation or MIS procedures; thus, it is not surprising that training in advanced interventions is not a recognized ACGME Pain Medicine milestone for graduation [19]. To fill this void, some societies have published recommended competencies for some advanced procedures and proposed required case numbers for graduation from pain fellowship [20].

As a result, the gap between academic training and post-graduate practice patterns is widening with the growing popularity of

minimally invasive spine and neuromodulation procedures. A study of Pain Medicine fellows in the 2021–2022 fellowship class highlighted the limited exposure that fellows have to many advanced procedures in training; survey respondents reported that they only performed a median of two or fewer intrathecal pump trials, intrathecal pump implants, peripheral nerve stimulators, vertebral augmentations, and vertebral body radiofrequency ablations during their fellowship [21].

Advanced training, and in some cases, FDA-mandated certification, has primarily occurred through industry-directed or society training programs. The lack of a universally accepted standard for these courses has resulted in significant variability in training, compounded by the absence of set standards for trainee selection and minimal prerequisites. Despite the success of many industry-led trainings in implementing novel pain procedures, there is a pressing need for standardization to ensure the safe and effective teaching of new interventional pain therapies [22].

Given that the ACGME-accredited Pain Medicine fellowship is only one year, achieving proficiency is becoming increasingly difficult with the growth in advanced procedure options and popularity. Suggested potential solutions include: 1) extending the fellowship duration, 2) requiring a general surgery preliminary year, 3) creating advanced pain tracks in residency programs, and 4) converting the Pain Medicine fellowship to an accredited residency with a curriculum that includes surgical training [23]. Other options for expanding training offerings could include: 5) forging relationships with local Pain Medicine practices where the fellows could partake in elective rotations, or 6) having professional societies create a private curriculum external to the academic environment to credential Pain Medicine physicians in these advanced procedures.

6. Challenges in academia with advanced procedure adoption and training

There are several challenges to introducing these advanced procedures in academic pain fellowship training. The American Board of Medical Specialties (ABMS) currently offers Pain Medicine certification for multiple specialties including Anesthesiology, Physical Medicine and Rehabilitation (PM&R), Neurology, Psychiatry, Family Medicine, Emergency Medicine, and Radiology. Because many fellows come from non-surgical backgrounds, these academic programs must strike a delicate balance between offering advanced procedures while ensuring a solid foundation in basic pain principles and procedural skills. Achieving this balance requires intensive spinal anatomy and mechanics training, appropriate patient selection, and collaboration with spine surgery colleagues to incorporate multidisciplinary expertise. MIS procedures, in particular, require intensive training as it pertains to the techniques for surgical decompression, instrumentation, and stabilization of the human spine [20].

Similarly, the second issue relates to the education gap among academic faculty, as many of the physicians are not formally trained to complete and do not perform advanced procedures. For those who have already completed their fellowships in Pain Medicine, how do they become competent in these novel procedures to teach the next generation? Is a weekend cadaver course enough? Discussions among academic physician colleagues have revealed that some do not perform novel procedures because they do not feel confident in their ability and their division's ability to manage potential complications from novel pain procedures. Furthermore, there is recent national evidence suggesting that Pain Medicine fellowship cadaver courses may not lead to comfortability in performing many interventional pain procedures [21].

The second hurdle to implementation involves hospital processes. Specifically, most academic hospitals require the approval of a hospital's Value Analysis Committee (VAC), which can be a protracted and resource-intensive process. In cases with limited evidence supporting a therapy, VAC approval may only be possible once there is more high-level evidence.

Additionally, other surgeons at the institution may refrain from accepting approval, as these novel techniques can be viewed as outside the scope of practice of Pain Medicine or in direct competition with orthopedic or neurosurgical practices. The American Association of Neurological Surgeons, in collaboration with seven other surgical societies, recently published a statement of opposition to physicians performing fusion procedures other than neurosurgeons and orthopedic spine surgeons [24].

7. Other challenges facing Pain Medicine

Teaching interventional treatments to applicants with varying procedural experience within the limited fellowship timeframe is a daunting task for all educators in Pain Medicine, however, it is not the only challenge. Faculty shortages, regulatory hurdles, payment reforms and lack of institutional support and funding, are all important issues for academic Pain Medicine. Furthermore, the fragmentation of Pain Medicine societies hinders unified advocacy for policy changes and funding support. Lastly, the changing landscape of healthcare with mergers and acquisitions among hospitals and health care system may impact the employment opportunities for fellowship graduates.

8. Future directions

The evolving landscape of pain fellowship training reflects a shift towards advanced procedures, such as MIS therapies and neuromodulation. These shifts are driven by the desire of trainees to stay current with emerging trends in the field. However, integrating these advanced procedures into fellowship programs presents challenges, including the need for standardization, potential extensions of training duration, and a comprehensive approach to the training. The field is at a critical juncture, necessitating ongoing discussions and collaboration among stakeholders to ensure that pain fellowship programs effectively equip trainees to meet the evolving needs of patients and the field of Pain Medicine.

While advanced procedures may seem like a threat to orthopedic or neurosurgical practices, Pain Medicine physicians can do a better job at explaining that the patients in whom these procedures are indicated are those patients who were deemed inappropriate candidates for major surgery - as their pathology is not severe enough to warrant major surgery, comorbidities preclude it, or the patient does not consent to major surgery. With clear definitions and boundaries of which patients are considered appropriate for certain surgeries, the fields can easily co-exist and benefit from each other by ultimately tailoring a patient-centric clinical pathway. Patients who were told they have no surgical options may now have innovative options for pain management.

Next, all of the procedures Pain Medicine physicians now routinely perform were once considered novel and "investigational," and the only way to establish an evidence base is to perform these procedures. Pain Medicine is a field defined by embracing innovation - both non-procedural and procedural. There is value in learning new techniques, doing them safely, and ensuring they are offered to the appropriate patients. For many novel procedures, data on long-term effectiveness are still emerging. Even the neuromodulation therapies (SCS, DRG-S, and PNS) with established evidence - industry has brought forth an ever-expanding set of indications, novel waveforms, and device options, and the evidence is struggling to keep pace.

As such, there is an opportunity for academic practices to lead the field in conducting high-quality, investigator-initiated research studies to ensure the novel therapy is appropriate by tracking outcomes and also discontinuing the therapy when it becomes clear that it may not be helpful, or even harmful. More investigator-initiated research on procedural therapies in Pain Medicine still needs to be done.

The time has come for the Pain Medicine community to execute a pathway forward. This is an exciting juncture. Our recommendation is to first support the fellowships by 1) using ambassadors at institutions to

engage trainees in Pain Medicine experiences to improve early exposure to the specialty, 2) emphasize the core values of a multimodal care plan through societal annual meeting offerings, 3) develop academic curricula and requirements for advanced pain procedures, 4) partner with academic spine surgeons to define scopes of practice and develop mutually beneficial relationships, 5) embolden academic practices to design and execute randomized controlled trials of the novel procedures to build evidence, 6) utilize enhanced high-fidelity simulation training, and 7) encourage collaboration and advocacy across the different pain societies at regional and national levels. These solutions will not only improve the caliber of Pain Medicine education but also answer the concerns raised by surgeons regarding training and supply insurance companies with the needed data to shift novel procedures from "investigational" to "standard of care." The time to act is now.

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None.

Declaration of competing interest

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Dr. Pritzlaff serves on the Board of Directors for the Association of Pain Program Directors. He is a paid consultant for SPR Therapeutics, Bioness, and Nalu Medical and receives royalties from Wolters Kluwer and Oxford University Press. He receives educational grants from Medtronic, Nevro, Abbott, and Biotronik.

Dr. Escobar serves as an executive medical advisor and paid consultant for Medtronic, Nevro, Painteq and Vertos Medical.

Dr. Kohan serves on the Board of Directors for the American Society of Regional Anesthesia and Pain Medicine and the American Academy of Pain Medicine. She is the immediate past president of the Association of Pain Program Directors and the president-elect for the Society of Academic Associations of Anesthesiology and Perioperative Medicine. She receives (ed) institutional research funding from AVANOS and FUS Mobile.

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