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Assessing Procedural Training for Internal Medicine Residents: Insights from Fellowship Program Directors

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Abstract

In 2019, the American Board of Internal Medicine (ABIM) revised its procedural training requirements, stating that internal medicine (IM) residents should have the chance to gain competence in procedures relevant to their intended subspecialty, rather than requiring all residents to master every procedure. The purpose of this survey was to identify which procedures fellowship directors believe incoming residents should understand, have limited experience with, or demonstrate competence in before starting the fellowship. To better understand subspecialty expectations, we surveyed fellowship directors (FDs) regarding which procedures they believe incoming fellows should be familiar with or competent to perform. Using the ACGME website, we identified 1,463 FDs across 15 IM subspecialties and invited them by email to complete a REDCap survey. The survey, developed by the study authors, included demographic items, a list of common procedures, Likert-scale questions about the value of procedural training in residency, and an open-ended item on perceptions of the ABIM changes. For each procedure, FDs indicated whether trainees should (1) understand the procedure, (2) have limited experience without competence, or (3) demonstrate competence. A total of 424 FDs responded, representing all 15 subspecialties. In 8 of the 15 subspecialties, most directors preferred that incoming fellows be competent in 1–10 of the 19 listed procedures (average of 5), though the specific procedures varied by specialty. Additionally, 100 free-text responses were analyzed and categorized into thematic groups. These findings can help IM residency program directors and residents align procedural training with subspecialty-specific expectations.

Keywords: Internal medicine procedural training, Fellowship readiness, ABIM requirements, Graduate medical education, Subspecialty procedures

Introduction

Training in diagnostic and therapeutic procedures is a fundamental component of medical education and patient care. Over the past two decades, requirements for procedural training have evolved significantly under both the American Board of Internal Medicine (ABIM) and the Accreditation Council of Graduate Medical Education (ACGME). These revisions have addressed not only the list of procedures required for graduation but also the methods by which procedural competence is taught.

Historically, internal medicine (IM) residents were required to complete a defined set of procedures, including venipuncture, arterial blood sampling, advanced cardiac life support, Pap smear/endocervical culture, and peripheral IV placement, to graduate [1]. Training was often delivered through the traditional "see one, do one, teach one" model, in which senior residents supervised juniors with minimal direct attending oversight [2]. Competence was measured by procedure

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counts rather than skill assessment, leading to inconsistent outcomes [3]. Notably, many residents reported discomfort performing procedures despite having met ABIM's minimum requirements [4, 5].

More recently, requirements have shifted. The 2021 ACGME Common Program Requirements state that "Residents must be able to perform all medical, diagnostic, and surgical procedures considered essential for the area of practice" [6]. ABIM has clarified that while not every resident must be competent in every procedure, all should have the opportunity to gain competence in procedures most relevant to their future careers [7]. In addition, IM residents are expected to demonstrate proficiency in informed consent, aseptic technique, establishing a sterile field, and administering local anesthesia.

Given that a majority of IM residents pursue subspecialty training—87.6% in the 2024 NRMP report, with procedural subspecialties drawing the largest applicant pools [8, 9]—program directors (PDs) face pressure to align residency procedural curricula with the expectations of subspecialty training. However, no standardized resource currently exists to guide PDs on which procedures are most valued by fellowship directors (FDs).

The purpose of this survey was to identify which procedures fellowship directors believe incoming residents should understand, have limited experience with, or demonstrate competence in before starting the fellowship. These findings may help residency programs tailor procedural training to meet the specific needs of subspecialties.

Materials and Methods

The survey was collaboratively developed by the study team, which included an IM program director, a gastroenterology fellowship director, a pulmonary critical care fellowship director, and a rheumatology subspecialty education director. It was pilot-tested by members of the research group to ensure clarity and face validity.

The instrument collected demographic information about the FD and fellowship program, followed by a list of procedures. For each procedure, respondents indicated whether incoming fellows should (1) possess only knowledge and understanding, (2) have some experience without competence, or (3) demonstrate competence. Competence was intentionally left undefined, as individual programs determine their own criteria [10]. The procedure list included former ABIM-required skills, commonly performed hospital procedures, and ultrasound applications such as central line placement, thoracentesis, and arthrocentesis.

Additional survey items included Likert-scale questions regarding the perceived value of procedural training in residency, as well as an open-ended question inviting opinions on ABIM's recent changes to procedural requirements.

For qualitative analysis of open-ended responses, two authors (ES, MW) independently reviewed and coded all comments using an inductive approach. Each author generated themes, which were then compared and consolidated into mutually agreed-upon categories with definitions. The two authors independently applied these themes to all comments, and discrepancies were resolved by a third author (KF).

Survey administration

Institutional Review Board approval was obtained from Northwell Health (IRB# 21–0048). The survey was distributed electronically using REDCap, and contact details for fellowship directors (FDs) were extracted from the ACGME directory. A total of 1,463 FDs across 15 internal medicine (IM) subspecialties were invited to participate. Each received an email describing the study and a secure link to the survey. The survey remained open from February 10 to May 23, 2021, with weekly reminder messages sent to non-respondents. All responses were anonymous.

Quantitative analyses included descriptive statistics to summarize demographic and geographic patterns, as well as chi-square tests to evaluate subspecialty-level differences in responses.

Results and Discussion

Of the 1,463 invitations, 424 surveys were completed, corresponding to a 29% response rate. Most subspecialties contributed more than 15 responses. On average, fellowship programs enrolled eight fellows, and respondents had been serving as directors for a mean of 7.4 years. Procedural expectations varied: while directors in most subspecialties reported that fellows perform procedures during training, the majority in geriatrics, hospice and palliative medicine, and Infectious Diseases indicated that procedures are not a routine part of

fellowship **(Table 1)**. Responses were broadly distributed across all US regions **(Table 2)**.

Table 1. Demographics by subspecialty

Fellowship program	# of FDs contacted	# of FD responders	Average years as FD	Average number of fellows per program	Do fellows perform procedures?	
					Yes	No
Allergy and immunology	60	17	5.9	4.0	17	0
Cardiovascular disease	196	47	6.4	13.6	47	0
Critical care medicine	36	7	6.8	7.0	7	0
Endocrinology, diabetes, and metabolism	126	45	6.1	4.7	43	2
Gastroenterology	160	43	7.4	11.3	43	0
Geriatric medicine	99	34	5.7	2.9	11	23
Hematology	1	1	20.0	17.0	0	1
Hematology and medical oncology	122	38	7.4	12.4	37	1
Hospice and palliative care medicine	143	32	3.5	2.7	8	24
Infectious disease	126	33	6.2	6.4	4	29
Nephrology	118	40	7.9	7.4	40	0
Medical oncology	5	1	4.0	9.0	1	0
Pulmonary disease	16	4	8.7	5.0	4	0
Pulmonary and critical care medicine	152	53	7.0	12.2	53	0
Rheumatology	103	29	8.3	4.6	29	0
Total	1463	424	7.42	8.1	344	80

FD = fellowship director.

Table 2. Responders by region

Region	Number of responders
West	59
Southwest	25
Midwest	96
Southeast	97
Northeast	156

Procedural competence expectations

In 8 of the 15 subspecialties surveyed, at least half of fellowship directors (FDs) indicated that incoming fellows should demonstrate competence in between 1 and 10 of the 19 procedures listed (mean = 5) **(Table 3)**. The specific procedures prioritized differed by specialty.

For example, most cardiology FDs expected competence in arterial line placement, central venous catheterization, venous and arterial blood draws, peripheral IV placement, and the use of vascular ultrasound for line placement. Pulmonary and critical care medicine directors emphasized a broader set of skills, including abdominal paracentesis, arterial and central venous lines, venous and arterial blood draws, nasogastric intubation, peripheral IV placement, and ultrasound-guided vascular access. In contrast, gastroenterology directors primarily highlighted abdominal paracentesis and nasogastric intubation, while hematology/oncology directors most often cited lumbar puncture as the only required skill. Nephrology directors commonly preferred competence in central venous line placement and ultrasound-guided vascular access.

In 7 subspecialties— allergy/immunology, endocrinology, geriatrics, hematology, hospice and palliative medicine, infectious diseases, and rheumatology—most directors reported that they did not expect incoming fellows to be competent in any of the listed procedures **(Table 3)**.

Table 3. Percentage of FDs by subspecialty preferring incoming fellow competence for procedures listed (bold indicates ≥ 50%)

Procedure	AI	C	CC	E	GI	G	H	H/O	PC	ID	N	O	P	P/CC	R
Abdominal paracentesis	0	6	71	2	70	9	0	26	22	12	3	0	75	79	0
Arterial line placement	0	81	71	2	14	3	0	5	0	3	8	0	50	70	0
Arthrocentesis	0	0	0	2	0	24	0	3	9	6	0	0	25	6	17

Central venous line placement	0	89	71	4	16	6	0	13	3	6	78	0	75	75	0
Drawing arterial blood	0	81	57	4	12	12	0	8	6	6	0	0	75	87	0
Drawing venous blood	0	87	57	4	12	12	0	8	6	6	0	0	75	87	0
Incision and drainage of abscess	0	0	0	4	7	26	0	3	19	27	0	0	25	4	0
Intraosseous (IO) placement	0	2	57	0	5	3	0	0	3	0	0	0	25	25	0
Lumbar puncture	0	4	57	2	7	15	0	61	3	33	3	100	75	49	0
Nasogastric intubation	0	15	57	2	86	21	0	5	25	3	0	0	75	55	0
Pap smear/endocervical culture	0	0	0	2	5	32	0	3	3	36	0	100	25	0	0
Peripheral venous line placement	12	70	57	9	30	24	0	21	22	9	13	100	50	62	3
Pulmonary artery catheter placement	0	34	0	0	2	0	0	0	0	0	0	0	0	6	0
Thoracentesis	0	9	14	2	7	6	0	24	9	3	3	0	25	36	0
Thoracic ultrasound (pleural effusion localization)	0	13	14	0	2	0	0	8	9	0	5	0	25	36	0
Vascular ultrasound (for line placement)	0	72	71	7	12	0	0	3	6	3	70	0	50	60	0
Cardiac ultrasound	0	32	14	0	2	0	0	0	0	0	0	0	0	6	0
Joint ultrasound	0	0	0	0	2	3	0	3	3	0	0	0	0	0	7
Abdominal ultrasound	0	0	0	0	9	0	0	3	9	0	8	0	0	9	0

AI = allergy/immunology, C = cardiology, CC = critical care, E = endocrinology, GI = gastroenterology, G = geriatrics, H = hematology, H/O = hematology and medical oncology, PC = hospice and palliative care, ID = infectious disease, N = nephrology, O = medical oncology, P = pulmonary, P/CC = pulmonary and critical care, R = rheumatology.

Fellowship directors' perspectives on ABIM procedural changes

The open-text item regarding concerns about recent ABIM modifications to internal medicine procedural requirements yielded 100 responses. Sixteen directors explicitly stated they had no problems, while 22 responses did not address the question. The remaining 62 comments were analyzed and grouped into 18 thematic categories. Only two remarks produced initial disagreement between reviewers, which a third adjudicator resolved.

The most frequently represented themes highlighted directors' worries about **f**undamental skill development, logistical and practical barriers, the preparedness of new fellows, evolving cultural expectations in training, subspecialty-specific procedural needs, and the shifting responsibility between residency and fellowship programs. Representative quotations illustrating these themes are provided in **Table 4**.

Table 4. Qualitative responses

Themes	Number	Percent	Representative quotes
Core competency skill	12	11%	Residents need to master basic procedures independently, as radiologists may not always be available around the clock.
Practical concern	10	9%	Many hospital procedures, such as central lines or lumbar punctures, are rarely performed in primary care or ambulatory specialties, making it challenging to maintain credentials post-residency.
Fellow readiness	10	9%	Trainees entering fellowships may struggle to quickly adapt to performing essential procedures, such as central or arterial line placements, required in intensive care settings.
Culture shift	7	6%	Nephrology fellowships have seen a decline in the number of fellows placing central lines compared to a decade ago, driven by time constraints and trainees' lack of prior experience, with little change expected soon.
Subspecialty-specific competency	5	5%	Understanding the risks and benefits of procedures is essential, but performing them should be left to specialists who do them regularly, except in procedural fields like general surgery.
Fellowship responsibility	5	5%	Fellowships typically ensure fellows achieve competency in necessary procedures within the first few months, meeting required standards.

Procedural training remains a cornerstone of internal medicine (IM) education. Recent ABIM guidelines set a minimum expectation for procedural competence at graduation but emphasize that residents should focus on procedures most relevant to their intended subspecialty or future practice in general internal medicine. This shift places responsibility on residency programs to create tailored opportunities for skill development.

To our knowledge, this study is the first national survey of IM subspecialty fellowship directors (FDs) assessing expectations for procedural competence since ABIM revised its requirements. The findings provide practical insight for residency program directors (PDs) and residents planning subspecialty careers.

As anticipated, the procedures considered essential varied widely across subspecialties. FDs in fields with substantial exposure to critically ill patients, such as cardiology, pulmonary/critical care, and critical care medicine, prioritized competence in multiple bedside procedures. In contrast, directors from other fields emphasized narrower skill sets—for example, paracentesis and nasogastric intubation in gastroenterology, lumbar puncture in hematology/oncology, and central venous access with ultrasound guidance in nephrology.

The evolution of ABIM's procedural expectations has been influenced by concerns regarding patient safety, duty-hour restrictions, and limited opportunities for hands-on training [11]. Prior studies suggest that residents increasingly report discomfort with basic bedside procedures [12]. While some directors in our survey questioned the need for broad procedural training—arguing that such skills are best reserved for specialists—most respondents supported continued resident involvement, noting benefits for patient safety, clinical ownership, and informed consent.

This study has several limitations. The overall response rate was modest, which may limit representativeness, although responses were diverse across both subspecialties and geographic regions. The survey focused exclusively on fellowship directors, leaving the needs of residents entering hospital medicine or primary care unaddressed. Regional differences could not be evaluated due to the anonymous survey design. In rural or resource-limited settings, where subspecialty support may be less readily available, residency-level procedural training remains essential. We also did not assess whether procedural competence influences fellowship selection decisions. Based on the authors' collective experience, this factor is unlikely to play a significant role. Finally, the qualitative component was constrained by a large proportion of responses that were difficult to categorize, and some directors were unaware of the recent ABIM policy changes.

Conclusion

Changes in ABIM procedural requirements reflect broader shifts in internal medicine training and practice over the past two decades, primarily driven by safety considerations and time constraints. Although the new framework eliminates universal core requirements, it underscores the importance of preparing residents for procedures that align with their career paths. Tailoring training to subspecialty expectations is therefore essential.

This survey provides initial guidance for residency PDs and residents by identifying which procedures fellowship directors value most in incoming trainees. Future research should extend this work to capture the perspectives of program directors in both hospital medicine and primary care, where procedural competence also plays a significant role.

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