ALLIANCE for ACADEMIC INTERNAL MEDICINE

AAIM Perspectives

AAIM is the largest academically focused specialty organization representing departments of internal medicine at medical schools and teaching hospitals in the United States and Canada. As a consortium of five organizations, AAIM represents department chairs and chiefs; clerkship, residency, and fellowship program directors; division chiefs; and academic and business administrators as well as other faculty and staff in departments of internal medicine and their divisions.

AAIM recommendations for post-core clerkship clinical rotations to prepare for residency in internal medicine

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INTRODUCTION

Internal medicine residency training is an intense, three-year immersion in a broad and demanding discipline; it is essential for medical students who are planning to pursue this path to have optimal preparation. To best prepare medical students for residency, there has been growing emphasis on improving the transition from undergraduate medical education (UME) to graduate medical education (GME). In 2021, the Coalition for Physician Accountability UME-GME Review Committee (UGRC) published recommendations aimed at enhancing this transition as current methods are insufficient to ensure competence in key intern responsibilities such as outpatient care, procedural consent, and recognition of clinical deterioration requiring escalation of care. Although these recommendations highlighted the gaps in the UME-GME transition, they primarily emphasized specialty-specific training for incoming first-year residents, rather than clinical experiences in the final year of UME outside of medical school capstone courses.[1]

While the Liaison Committee on Medical Education (LCME) and the American Osteopathic Association Commission on Osteopathic College Accreditation (COCA) define early required clinical experiences for medical students in the form of core clerkships, the final year of advanced clinical experiences lacks standardization and is left to the discretion of individual medical schools. Additionally, there has been a recent decline in exposure to clinical internal medicine education in UME nationally, including reduced inpatient

Credit Authorship Contribution Statement: Lauren M. DiMarino: Conceptualization, Methodology, Project administration, Writing – original draft, Writing – review & editing. **Uma S. Ayyala:** Conceptualization, Methodology, Project administration, Writing – original draft, Writing – review & editing. **Adam Garber:** Conceptualization, Methodology, Visualization, Writing – review & editing. **John H. Choe:** Conceptualization, Visualization, Writing – review & editing. **Reeni Abraham:** Conceptualization, Visualization, Writing – review & editing. **Paul O'Rourke:** Conceptualization, Visualization. **Kathleen Cooney:** Conceptualization. **Ricardo Correa:** Conceptualization. **Catherine Apaloo:** Conceptualization. **Amber T. Pincavage:** Conceptualization, Methodology, Project administration, Writing – original draft, Writing – review & editing.

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0002-9343/$ -see front matter Published by Elsevier Inc.
https://doi.org/10.1016/j.amjmed.2025.09.003

time, dedicated internal medicine-specific ambulatory time, and post-core clerkship internal medicine experiences.[2] A 2017 survey of clerkship directors revealed that 74.8 % of schools did not require an advanced internal medicine clinical experience after the core clerkship for all students regardless of specialty choice.[2]

The internal medicine subinternship (also referred to as an acting internship) has been a cornerstone of advanced clinical education for students pursuing internal medicine residency for decades, undergoing significant transformation over time. Initially, specific structure and experience recommendations were outlined in 1992 by the Alliance for Academic Internal Medicine (AAIM), followed by the development of a core curriculum in 2002,[3] which culminated in clearly defined goals and objectives established in 2012 by AAIM, with a secondary revision published in 2018.[4] Many experts recommend subinternship for all students pursuing internal medicine residency training.[2-10] Although a 2023 survey of clerkship directors found that all participating medical schools required students to complete a subinternship to graduate, only a small percentage (10 %) required every student to complete a subinternship in internal medicine, regardless of their chosen specialty (Garber).[11] Despite the recommendation that students pursuing internal medicine residency complete an internal medicine subinternship, variance exists nationally within subinternship rotations as recent survey data showed that 15.5 % of schools do not have a structured subinternship curriculum and less than half of schools (47.1 %) have not utilized any component of *AAIM Subinternship Curriculum 2.0*.[11] Aside from the subinternship rotation, additional advanced clinical rotation recommendations for internal medicine-bound students have been limited and medical school expectations are not cohesive.

Due to the lack of standardization of the 4th year of medical school training, significant variability in curriculum expectations for medical students exists and consequently, students have the freedom to choose elective rotations.[8] These electives are often selected to aid in career decisions, enhance exposure to their field of interest, address self-identified cognitive or procedural deficits, and participate in rotations at institutions other than their own to improve their chances of matching at those institutions (known as away or audition rotations).[7,12-13] While this flexibility may facilitate precision education and self-directed learning, it carries the risk of diminishing essential clinical skills needed for a successful transition to residency.

To enhance specialty-specific skill attainment and to preserve focus and preparation for rigorous residency training, various disciplines—including general surgery,[14] ophthalmology,[15] plastic surgery,[16] obstetrics and gynecology,[17] and family medicine[18] —have begun recommending specialty-specific fourth-year clinical rotations. For instance, an analysis by Hueston et al. revealed that both residency directors and pre-doctoral educators advise students pursuing family medicine residency to undertake an ambulatory family medicine month in their 4th year, along with electives in emergency medicine, dermatology, obstetrics, and a subinternship in internal medicine.[18]

Although there have been attempts to offer similar guidance to internal medicine-bound medical students, comprehensive guidelines currently do not exist. Recommendations have included proposed flexibility and options for individualization in the 4th year,[19] and a focus on clinical rotations that review and clinically correlate basic science to clinical medicine and promote the development of analytic and interpretive skills.[5] An Alliance for Clinical Education (ACE) perspective paper proposing specialty-specific 4th year curricula recommended an internal medicine subinternship and electives in pathophysiology clinical correlative courses, quality and safety, evidence-based medicine, and a procedural skills course for internal medicine-bound students. However, this paper did not delineate additional recommended clinical rotations outside of the subinternship.[5]

Through exploration of the literature and consensus recommendations, the Alliance recommends additional critical specialty-specific clinical rotations in the final year of medical school beyond the subinternship to best prepare students for GME training in internal medicine.

PERSPECTIVES VIEWPOINTS

In addition to an inpatient subinternship in internal medicine, AAIM recommends students pursuing internal medicine should complete:

- At least four weeks of critical care (ie, intensive care unit) clinical rotations in medical school with at least two weeks within one year of starting residency
- At least four weeks of internal medicine primary care ambulatory clinical rotations within one year of starting residency, optimally with some experience in the six months prior to starting residency
- At least two weeks of any clinical experience with patient engagement within six months prior to starting residency

METHODS

These recommendations were developed through a comprehensive review of existing literature and informed input from expert clinician educators and a

broad range of stakeholders. The literature review focused on current curricula required by LCME and COCA, the Association of American Medical Colleges (AAMC) Core Entrustable Professional Activities (EPAs) for Entering Residency,[20] studies involving internal medicine residency leadership and residents, proposed recommendations for specialty-specific clinical rotations for internal medicine-bound students, UME-GME transitions literature, and the skills needed for a successful transition to residency.[1-19,21-30]

Preliminary recommendations were established following the literature review, with guiding principles centered on desired skill attainment by categorizing skills based on the AAMC-American Association of Colleges of Osteopathic Medicine-Accreditation Council on Graduate Medical Education (ACGME) Foundational Competencies for UME,[21] mapping each recommended skill to the AAMC Core EPAs,[20-22] to ACGME Internal Medicine milestones,[23] and to recommended clinical rotations (Table 1).[10,24] Clinical rotation recommendations were also created based on existing literature regarding 4th year clinical education in internal medicine. Feedback on these recommendations was then sought within the continuum of AAIM, allowing for deeper analysis and consideration.

CLINICAL ROTATION RECOMMENDATIONS AND RATIONALE

In addition to an inpatient subinternship (ie, acting internship) in internal medicine, students pursuing internal medicine should complete the following clinical rotations to achieve the desired advanced clinical skills (Table 1):

- At least four weeks of critical care (ie, intensive care unit) clinical rotations in medical school with at least two weeks within one year of starting residency.
- At least four weeks of internal medicine primary care ambulatory clinical rotations within one year of starting residency, optimally with some experience in the six months prior to starting residency.
- At least two weeks of any clinical experience with patient engagement within six months prior to starting residency.

Critical Care (Intensive Care Unit)

Advanced Skill attainment:

- Give or receive a patient handover to transition care responsibility – EPA8
- Collaborate as a member of an interprofessional team - EPA9
- Recognize a patient requiring urgent or emergent care and initiate evaluation management (including ventilatory and pressor management) – EPA10
- Obtain informed consent for tests and/or procedures – EPA11
- Perform general procedures as a physician (eg, basic cardiopulmonary resuscitation (CPR), bag and mask ventilation, venipuncture, inserting an intravenous line) – EPA12
- Enhance communication skills for end-of-life discussions

Recent studies have shown that fourth-year medical students feel less prepared to handle unstable patients compared to those who are less ill, resulting in a deficiency in competence in the assessment and initial management of unstable patients.[25] Additionally, students entering internal medicine residency frequently have self-identified a need for improvement in recognizing patients requiring urgent or emergent care and providing initial management as well as managing patients in the intensive care unit (ICU) setting, particularly related to ventilator and pressor management.[26-27] One study analyzing incoming individualized learning plans for transitioning into internal medicine residency found that medical students feel least prepared in two essential competencies where skill development could be attained on an ICU rotation: recognizing a patient requiring urgent or emergent care and being able to provide initial management, and managing patients in the ICU setting, particularly related to managing ventilators and patients requiring pressor support.[26-27] Obtaining informed consent for procedures was also identified as a gap in critical care skills that could be addressed through ICU experiences.

A national survey of internal medicine residents demonstrated that 23% of respondents did not complete any ICU rotations during medical school. A lack of medical school ICU experience had a negative association with self-assessed preparedness for ICU-related competencies, and the length of ICU exposure was also associated with preparedness.[28] Overall, 73% of internal medicine residents self-identified that they felt prepared to recognize patients requiring urgent or emergent care at the start of residency, with preparedness increasing with longer durations of medical school ICU rotations. Those who had ICU exposure in medical school greater than 10 months prior to residency rated their preparedness more negatively. Additionally, only 33% of residents felt prepared to manage patients in the ICU settings (ie, use of ventilators and pressors) at the start of residency.[28] The Core EPAs for Entering Residency Pilot also demonstrated that only 2% of students were deemed ready for entrustment in EPA 10 (Recognize a Patient Requiring Urgent or Emergent Care and Initiate Evaluation and Management) in the pilot schools cohort, and only 54% of early PGY1 pilot school graduates felt ready for indirect supervision at the start of intern year.[29]

Table 1 Recommended Rotations for Skill Attainment

Skill Category (AAMC-AACOM-ACGME foundational competencies for UME)[21]	Recommended Skill[10,24]	AAMC Core EPA[20,22]	ACGME Milestone[23]	Recommended Rotation
Patient Care: History Taking and Physical Examination	Obtains focused, pertinent history elements in urgent, emergent and consultative settings	EPA 1: Gather a history and perform a physical examination	Patient Care (1,2)	Subinternship IM Ambulatory Rotation Critical Care Rotation
Patient Care: Differential Diagnosis and Clinical Reasoning	Uses a framework for clinical reasoning Uses evidence-based guidelines for common conditions	EPA 2: Prioritize differential diagnosis following a clinical encounter	Patient Care (3) Medical Knowledge (1)	Subinternship IM Ambulatory Rotation Critical Care Rotation
Patient Care: Recognition and Management of Urgent and Emergent Care	Identifies patients who are critically ill Appropriately assesses and manages acute respiratory failure Appropriately assesses and manages patients with hemodynamic instability	EPA 10: Recognize a patient requiring urgent or emergency care and initiate evaluation and management	Patient Care (1,2,4)	Subinternship Critical Care Rotation Ambulatory Rotation
Medical Knowledge: Diagnostic Testing	Appropriately Interprets and manages basic electrocardiograms Appropriately Interprets and manages common abnormal laboratory tests Appropriately selects and interprets common radiologic studies	EPA 3: Recommend and interpret common diagnostic and screening tests	Patient Care (4,5) Medical Knowledge (2,3)	Subinternship IM Ambulatory Rotation Critical Care Rotation
Patient Care: EHR use and Digital Health	Effectively navigates the EHR for routine patient care	EPA 1: Gather a history and perform a physical examination	Patient Care (6)	Subinternship IM Ambulatory Rotation Critical Care Rotation
Patient Care: Patient M anagement and Order Entry	Appropriately selects and orders common inpatient medications Appropriately selects and orders common outpatient medications Appropriately selects and orders intravenous fluids Appropriately selects and orders antimicrobial therapy Appropriately adjusts medications for patient's co-morbidities	EPA 4: Enter and discuss orders and prescriptions	Patient Care (4,5) Medical Knowledge (2)	Subinternship IM Ambulatory Rotation Critical Care Rotation
Patient Care: Procedural Skills	Obtains informed consent for procedures such as blood transfusion, central venous catheter, paracentesis, lumbar puncture Effectively performs venipuncture, arterial blood gas, bag valve mask ventilation and defibrillation	EPA 11: Obtain informed consent for tests and/or procedures EPA 12: Perform general physician procedures	Medical Knowledge (2,3) Patient Care (4)	Subinternship Critical Care Rotation
Interpersonal and Communication Skills: Documentation	Writes efficient, effective, and succinct admission notes, progress notes, and discharge summaries. Writes a clear death note.	EPA 5: Document a clinical encounter in the patient record	Patient Care (6) Interpersonal and Communication Skills (3)	Subinternship IM Ambulatory Rotation Critical Care Rotation
Interpersonal and Communication Skills: Patient and Family Communication	Effectively discusses goals of care and code status with patients and their families		Interpersonal and Communication Skills (1)	Subinternship Critical Care Rotation
Interpersonal and Communication Skills: Team Communication	Effectively presents a patient on rounds Effectively presents an outpatient to a supervising attending Effectively presents a patient when calling a consult Effectively presents a patient for a conference (eg, morning report, morbidity and mortality conference)	EPA 6: Provide an oral presentation of a clinical encounter	Interpersonal and Communication Skills (2)	Subinternship IM Ambulatory Rotation Critical Care Rotation

Table 1 (*Continued*)

Skill Category (AAMC-AACOM-ACGME foundational competencies for UME)[21]	Recommended Skill[10,24]	AAMC Core EPA[20,22]	ACGME Milestone[23]	Recommended Rotation
Interpersonal and Communication Skills: Interprofessional Communication	Effectively communicates with interprofessional team members Effectively manages conflict with other team members Responds promptly and effectively to pages from other healthcare members	EPA 9: Collaborate as a member of an interprofessional team	Systems-Based Practice (2)	Subinternship IM Ambulatory Rotation Critical Care Rotation
Practice-Based Learning and Improvement: Evidence-Based Practice	Effectively uses evidence-based medicine to answer clinical questions	EPA 7: Form clinical questions and retrieve evidence to advance patient care	Practice-Based Learning and Improvement (1)	Subinternship IM Ambulatory Rotation Critical Care Rotation
Systems-Based Practice: Patient Safety and Quality Improvement	Effectively discloses an adverse event to a patient or family member Recognizes and appropriately reports patient safety issues	EPA 13: Identify system failures and contribute to a culture of safety and improvement	Systems Based Practice (1)	Subinternship Ambulatory Rotation Critical Care Rotation
Systems-Based Practice: Care Transitions	Effectively provides handoff or signout during patient care transitions.	EPA 8: Give or receive a patient handover to transition care responsibility	Systems-Based Practice (2)	Subinternship Critical Care Rotation
Professionalism	Effectively manages time and prioritizes daily tasks		Professionalism (3)	Subinternship Ambulatory Rotation Critical Care Rotation

These findings highlight the importance of incorporating ICU rotations into the medical school curriculum to better prepare students for the challenges of residency, particularly in managing critically ill patients. Additionally, given the volume of procedures in ICU settings, ICU clinical experiences can offer additional preparedness and comfort with procedures and provide an opportunity for students to gain skills in obtaining consent to meet Core EPAs. Thus, AAIM recommends at least 4 weeks of critical care clinical rotations in medical school with at least 2 weeks within 1 year prior to starting residency for internal medicine-bound students.

It is important to recognize that critical care/ICU rotations can vary significantly depending on the setting. These differences may stem from the unit's specific focus, such as medical, surgical, cardiac, or trauma as well as the complexity of the patients treated. Each type of ICU offers unique and valuable learning opportunities. However, due to limitations in rotation capacity and availability, student experiences may differ widely.

While a medical ICU rotation is ideal for students pursuing internal medicine, any critical care experience can provide meaningful clinical exposure and skill development. Therefore, AAIM recommends students pursuing internal medicine spend some of the recommended critical care clinical time in a medical ICU rotation if possible. If it is not feasible, other ICU experiences would also be highly valuable and offer strong preparation for residency.

AAIM acknowledges that some medical schools allow students to complete a subinternship in the ICU as an alternative. This approach would satisfy the requirements of the recommendation and additional rotations would not be necessary.

Internal medicine primary care ambulatory

Advanced Skill attainment:

- Enter and discuss orders and prescriptions - EPA4
- Document a clinical encounter in the patient record - EPA5
- Provide an Oral Presentation of a clinical encounter - EPA6
- Collaborate as a member of an interprofessional team - EPA9
- Clinical reasoning skill development

While there has been substantial endorsement for the subinternship and the value of inpatient experiences, there has been considerably less emphasis on the importance of robust internal medicine primary care ambulatory training in UME. A 2017 survey of clerkship directors revealed that while 100% of respondents reported that students spent some amount of time on an inpatient service during their internal medicine core clerkship, 65.4% of respondents indicated that their students were not required to have an internal medicine-specific ambulatory experience.[2] In the last year of medical school, less than one-third of medical schools required a primary care rotation.[2,8] One study found the majority of internal medicine interns at four different institutions had no internal medicine primary

care clinic experience during their last year of medical school while a national study demonstrated 22% of internal medicine residents had fewer than 2 weeks of primary care experience in the last 12 months of medical school.[30]

This lack of primary care ambulatory experience is concerning, as it leaves many interns feeling unprepared for managing patients in the primary care clinic at the start of their residency.[26-27,30] A national survey of all internal medicine residents found 48% self-reported feeling unprepared to manage primary care patients at the start of residency.[30] Notably, having any primary care experience during the final year of medical school significantly improves the odds of feeling prepared for residency primary care clinic in a dose-dependent fashion. It was determined that greater than 4 weeks of primary care training in the 4th year was associated with a two-fold increase in preparedness for clinic.[30]

Moreover, an internal medicine primary care ambulatory rotation offers a unique opportunity to develop a wide range of essential skills and core EPAs. These skills include entering and discussing orders and prescriptions, documenting a clinical encounter in the patient record, collaborating as a member of an interprofessional team, and enhancing clinical reasoning and presentation skills. Furthermore, the primary care ambulatory setting allows students to build long-term relationships with patients, understand the continuum of care, and appreciate the importance of preventive medicine.

Incorporating a robust internal medicine primary care ambulatory rotation into the medical school curriculum would better prepare students to meet the demands of residency and beyond. This experience would bridge the gap between inpatient and outpatient care, offering a more well-rounded and comprehensive training experience. Therefore, AAIM recommends a minimum of 4 weeks of internal medicine primary care ambulatory clinical rotations within 1 year prior to starting residency, ideally including some experience within the 6 months leading up to residency. Ultimately, this approach would cultivate more confident and competent physicians who are better equipped to navigate the challenges of internal medicine resident continuity clinic.

While these recommendations emphasize internal medicine primary care ambulatory experiences, they also encompass medicine-pediatrics and geriatrics. Similar to the challenges encountered with critical care rotations, internal medicine primary care ambulatory opportunities may be limited due to capacity and availability constraints. In such cases, subspecialty ambulatory or family medicine rotations are recommended alternatives as they provide valuable learning experiences and help develop essential clinical skills.

Clinical experience with patient engagement

Advanced Skill attainment:

- Address EPAs in need of more development
- Maintain clinical skills and avoid knowledge decay

The final year of medical school training presents several competing priorities. Students typically spend the first half of the academic year exploring residency options, studying for USMLE Step 2 or COMLEX Level 2, applying to residency programs, auditioning at various clinical sites, and interviewing for residency positions. The second half of the academic year shifts focus to completing medical school requirements. Due to the lack of structure and requirements in the final year, students often have options for non-traditional rotations that incorporate remote learning and do not require hands-on patient engagement, making the academic quality uncertain.[12-13]

Additionally, most medical students graduate approximately 2 months before beginning residency, resulting in a gap during which they have limited or no patient engagement. This gap can pose a significant challenge since students must reacclimate to the clinical environment at a crucial time when the level of responsibility and autonomy increases exponentially. There is growing recognition that the objectives and value of curricula of the fourth-year curriculum should be revisited to better support the transition to residency.[12,13]

To enhance successful integration into GME, AAIM recommends that students complete a two-week hands-on clinical experience that incorporates patient engagement within 6 months of starting residency, if possible. This approach ensures that students maintain their clinical skills and are better prepared for the demands of residency training.

SPECIAL CONSIDERATIONS AND DISCUSSION

Clinical experiences in UME vary significantly between medical school types and even within each type. This variability is influenced by several factors such as class size, the availability and quality of clinical rotation sites, logistical considerations like finances and travel, and the level of institutional support. Additionally, the structure and duration of the post-core clerkship phase can impact student ability to explore medical subspecialties. While recommended rotations provide valuable preparation, strict adherence to them may limit opportunities for career exploration. Therefore, AAIM encourages students to prioritize the recommended rotations when possible, while recognizing that it may not be feasible for everyone.

One potential solution is to offer more two-week rotation options alongside traditional four-week blocks,

increasing flexibility and enabling students to participate in experiences they might otherwise miss. Many medical schools begin the post-clerkship phase more than 12 months before residency; AAIM acknowledges that completing the recommended experiences within that timeframe would also be valuable.

AAIM also recognizes that international medical students and graduates may not have access to hands-on clinical experiences in the United States. However, they may have opportunities for comparable experiences in their home countries that align with these recommendations. When available in the United States, these experiences are often observational rather than fully integrative. Although this has historically posed a challenge for this group, the recommendations can serve as a guide to help prioritize educational experiences, whether within their own medical school or through US-based opportunities.

The clinical rotation recommendations for internal medicine-bound medical students focus on acquiring essential skills during the final year of medical school to support a successful transition to residency. AAIM has identified four key clinical experiences, acknowledging that numerous factors may limit student ability to participate in these rotations. These factors include curriculum restrictions imposed by the medical school, limited availability of rotation sites, scheduling conflicts, and geographic and financial constraints.

In addition to recommending specialty-specific clinical rotations, AAIM has outlined key clinical skills that should be optimized before starting an internal medicine residency in Table 1. Given the constraints on clinical experiences, these identified skills can also serve as a guide for selecting available alternative rotations that will help develop these competencies.

Funding sources

There are no funding sources.

Conflict of interest (COI) statements

The authors have no conflicts of interests. Please see additional uploaded files under the Declaration of Interest Statement section for individual COI statements.

Access to data

The author(s) declare(s) that they had full access to all the data in this study and the author(s) take(s) complete responsibility for the integrity of the data and the accuracy of the data analysis.

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