

Confidence of Graduating Internal Medicine Residents to Perform Ambulatory Procedures

Glenda C. Wickstrom, MD, MS, Maria M. Kolar, MD, Thomas C. Keyserling, MD, MPH, David K. Kelley, MD, Sharon X. Xie, PhD, Bryan A. Bogнар, MD, Carmen L. Lewis, MD, Connie T. DuPre, MD

OBJECTIVE: To evaluate the training of graduating internal medicine residents to perform 13 common ambulatory procedures, 3 inpatient procedures, and 3 screening examinations.

DESIGN: Self-administered descriptive survey.

SETTING: Internal medicine training programs associated with 9 medical schools in the eastern United States.

PARTICIPANTS: Graduating residents ($N = 128$); response rate, 60%.

MEASUREMENTS AND MAIN RESULTS: The total number of procedures performed during residency, importance for primary care physicians to perform these procedures, confidence to perform these procedures, and helpfulness of rotations for learning procedures were assessed. The majority of residents performed only 2 of 13 outpatient procedures 10 or more times during residency: simple spirometry and minor wound suturing. For all other procedures, the median number performed was 5 or fewer. The percentage of residents attributing high importance to a procedure was significantly greater than the percentage reporting high confidence for 8 of 13 ambulatory procedures; for all inpatient procedures, residents reported significantly higher confidence than importance. Continuity clinic and block ambulatory rotations were not considered helpful for learning ambulatory procedures.

CONCLUSIONS: Though residents in this sample considered most ambulatory procedures important for primary care physicians, they performed them infrequently, if at all, during residency and did not consider their continuity clinic experience helpful for learning these skills. Training programs need to address this deficiency by modifying the curriculum to en-

sure that these skills are taught to residents who anticipate a career in primary care medicine.

KEY WORDS: residents; confidence; training; ambulatory procedures.

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Traditionally, internal medicine residency training has centered on care of hospitalized patients. However, as health care delivery shifts away from the hospital toward the ambulatory setting, training internists who are proficient in a broad array of ambulatory care skills is becoming increasingly important.¹⁻⁴ In response, the amount of time residents spend in ambulatory training has increased, and organizations for graduate medical education have developed curricula describing the ambulatory skills that residents should master.⁵⁻⁹ Expansion of training time and enhanced curricula, however, may not be sufficient to ensure that internal medicine residents are trained to provide comprehensive adult ambulatory care. Training to perform common ambulatory procedures is one area of particular concern.^{4,10-13} Knowing which ambulatory procedures residents are performing and which training sites are useful for learning these procedures is a necessary step to ensure sufficient training opportunities. This survey of graduating internal medicine residents describes their attitudes toward and training experiences in 13 common ambulatory procedures and, for comparison, 3 common inpatient and screening procedures.

METHODS

During May 1996, questionnaires were distributed by mail or by hand to all 216 graduating internal medicine residents at 9 eastern academic institutions. Nonrespondents received a reminder postcard at 2 weeks, a second questionnaire at 4 weeks, and personal contact by the researcher at 6 weeks after receiving the questionnaire.

Thirteen ambulatory procedures, 3 inpatient procedures, and 3 screening examinations were included in the questionnaire and are listed in Table 1. The ambulatory procedures, all common to the practice of adult primary care, were selected after a review of the literature, including published procedural skills surveys sent to program directors, practicing physicians, and recent graduates.^{4,11-15} It was the consensus of investigators that residents at their institutions commonly performed and tracked inpatient procedures, but not ambulatory procedures. Thus, inpatient procedures were included for comparison. The screening examinations were included as representative

Received from the Department of Medicine, Summa Health System/Northeastern Ohio Universities College of Medicine, Akron, Ohio (GCW); Section of Internal Medicine, West Virginia University School of Medicine, Morgantown, WVa (MMK); Department of Medicine, University of North Carolina at Chapel Hill School of Medicine, Chapel Hill, NC (TCK); Department of Medicine, Pennsylvania State University School of Medicine, Hershey, Pa (DKK); Department of Health Evaluation Sciences, Pennsylvania State University, Hershey, Pa (SXX); Department of Internal Medicine, University of South Florida School of Medicine, Tampa, Fla (BAB); Department of Medicine, University of Virginia School of Medicine, Richmond, Va (CLL); and Section of General Medicine, Medical College of Georgia, Augusta, Ga (CTD).

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Address correspondence and reprint requests to Dr. Wickstrom: 75 Arch St., Suite 303, Akron, OH 44304 (e-mail: wickstrg@summa-health.org).

Table 1. Procedures and Examinations Performed During Residency and Percentage of Residents Who Tracked and Anticipated Certification for Procedures

Procedures/Examinations	Median Number	Performed Any, %	Performed ≥ 10 , %	Tracked, %	Anticipated Certification, %
General procedures					
Flexible sigmoidoscopy*	1.5	61	26	76	16
Spirometry interpretation†	20.0	86	73	54	26
Fluorescein eye examination	4.0	81	24	56	19
EKG treadmill stress test*	1.0	52	23	61	12
Endometrial biopsy*	0.0	15	1	58	4
Dermatologic procedures					
Minor wound suturing	15.0	95	73	54	29
Cryotherapy of skin lesions	3.0	61	32	57	14
Simple abscess incision and drainage	2.0	72	19	54	17
Skin punch biopsy*	1.0	56	7	60	13
Orthopedic procedures					
Knee joint aspiration‡	5.0	93	31	70	54
Knee joint injection	2.0	72	17	70	43
Splinting a sprained ankle	1.0	50	8	56	10
Ingrown toenail removal	0.0	28	3	57	7
Inpatient procedures					
Central line placement‡	30.0	99	93	87	82
Paracentesis‡	15.0	99	77	87	81
Thoracentesis‡	10.0	100	73	87	81
Screening examinations					
Digital prostate	100.0	100	100	NA§	NA
Routine breast	50.0	100	100	NA	NA
Pap/pelvic	34.5	100	92	NA	NA

*Procedural skills listed by the Residency Review Committee as additional (at the discretion of the training program), but not listed by the American Board of Internal Medicine.

†Interpretive skill listed by the Residency Review Committee as one that all residents should have the opportunity to learn, but not listed by the American Board of Internal Medicine.

‡Procedural skills required for training and certification, as listed by both the Residency Review Committee for Internal Medicine and the American Board of Internal Medicine.

§NA indicates respondents were not asked.

of clinical skills traditionally obtained by all internal medicine residents, to serve as a comparison for both inpatient and ambulatory procedural skills. Those procedures listed in the Residency Review Committee (RRC) Program Requirements for Residency Education in Internal Medicine⁵ and those listed in the American Board of Internal Medicine (ABIM) Policies and Procedures for Certification¹⁶ are identified in Table 1.

For each procedure and examination, respondents estimated the total number performed during residency (with and without supervision) and indicated if their residency program "tracked" their performance and if they anticipated their programs would certify or "sign off" on their competence to perform that skill. Using Likert scales (1 = not confident, important, or helpful and 6 = very confident, important, or helpful), residents rated their confidence to perform, the importance for primary care physicians to perform, and helpfulness of training sites for learning these skills. Training sites included the ambulatory continuity clinic, block ambulatory rotations (e.g., ambulatory gynecology, ophthalmology, dermatology, orthopedics, and otolaryngology), the inpatient gen-

eral medicine service, subspecialty services (inpatient and outpatient), and the emergency department. Also, respondents estimated their time spent in the continuity clinic and block ambulatory rotations and indicated anticipated career choices.

McNemar's χ^2 test was used to compare residents' assessment of the importance of performing a procedure with their confidence to perform the procedure. All analyses were performed using Epi-Info (Centers for Disease Control and Prevention, Atlanta, Ga) and SAS software systems (SAS Institute, Cary, NC). Two-sided *P* values are reported.

RESULTS

A total of 128 residents completed the questionnaire for a final response rate of 60%. Excluding one large institution with a response rate of 32%, the overall response rate was 72%. Sixty percent of respondents were male, and 80% were U.S. medical graduates. About half (51%) planned to practice general internal medicine, and 41% planned a subspecialty fellowship. Most planned to practice in a city (31%) or in a large metropolitan area (43%).

While 48% anticipated joining a private practice, only 5% expected to work for an HMO as a staff physician. For each year of training, residents spent a median of a half-day per week in the continuity clinic; for each of the second and third years, they reported a median of 2 ambulatory block rotations.

The median number of procedures performed, the percentage of residents performing any procedure and 10 or more procedures, and the percentage of residents tracking and anticipating certification are shown in Table 1. There were only 2 outpatient procedures that the majority of residents performed 10 or more times during their residency: interpretation of simple spirometry and minor wound suturing; for all others, the median was 5 or less. Residents frequently performed the inpatient procedures and screening examinations. A large majority of residents tracked and anticipated certification for all inpatient procedures. In contrast, the percentage of residences who tracked ambulatory procedures ranged from 54% to 76% and the percentage of residents that anticipated certification for ambulatory procedures was less than 30% except for knee joint aspiration (54%) and injection (43%).

The percentages of residents who selected 5 or 6 on the 6-point Likert scale for importance and confidence to perform each procedure are shown in Table 2. For ambulatory procedures, these percentages varied greatly, with importance ranging from 13% to 71% and confidence ranging from 6% to 69%. For inpatient procedures, the range was 42% to 64% for importance and 81% to 91% for confidence. Although the percentage reporting high importance was significantly greater than the percentage reporting high confidence for 8 of the 13 ambulatory procedures, the percentage reporting high importance was significantly less than the percentage reporting high confidence for all of the inpatient procedures. For the screening examinations, almost all residents reported high importance and confidence.

Residents reported low (median, 1–2) to moderate (median, 3–4) helpfulness scores for all ambulatory procedures across all training sites and rotations, with two exceptions. They considered the medical subspecialty service very helpful for learning interpretation of simple spirometry (median score, 5) and the emergency department very helpful for learning minor wound suturing (median score, 6). Specifically, residents did not identify the continuity clinic as helpful for learning any ambulatory procedure (median scores, ≤ 2), nor did they consider block ambulatory rotations helpful (median scores, ≤ 3.5). Regarding inpatient procedures, residents reported high helpfulness scores for the inpatient general medicine service (median scores, 6); for the screening examinations, they credited the continuity clinic as very helpful (median scores, ≥ 5).

DISCUSSION

Our study suggests that internal medicine residents are inadequately trained to perform many ambulatory

Table 2. Percentages of Residents Ranking Highest Scores (5 or 6) for Importance to Perform and Confidence Performing Procedures and Examinations

Procedures	Importance Performing, %	Confidence Performing, %
General procedures		
Flexible sigmoidoscopy	51	9*
Simple spirometry interpretation	67	66
EKG treadmill stress test	42	23*
Fluorescein eye examination	47	43
Endometrial biopsy	13	6 [†]
Dermatologic procedures		
Abscess incision & drainage	62	48 [‡]
Cryotherapy of skin lesions	39	44
Minor wound suturing	70	69
Skin punch biopsy	38	25 [†]
Orthopedic procedures		
Knee joint aspiration	71	63
Knee joint injection	61	51 [†]
Splinting a sprained ankle	56	27*
Ingrown toenail removal	39	16*
Inpatient procedures		
Central line placement	42	81*
Paracentesis	61	87*
Thoracentesis	64	91*
Screening examinations		
Digital prostate	96	98
Routine breast	95	95
Pap/pelvic	92	89

* $P < .001$; P values were calculated using the McNemar's χ^2 test comparing importance and confidence rankings.

[†] $P < .05$.

[‡] $P < .01$.

procedures common to the practice of adult primary care medicine. Generally, residents performed only a few of the ambulatory procedures surveyed and identified only a few helpful training sites or rotations for learning these procedures. The continuity clinic and ambulatory block rotations, which comprise most of residents' ambulatory training time,^{6,17} were not considered helpful for learning any of the ambulatory skills surveyed. Furthermore, residents did not consistently report learning ambulatory procedures during other rotations.

High importance scores along with low confidence scores for performing ambulatory procedures suggest a willing learner as well as a need to expand learning opportunities. Recent initiatives to increase the total amount of time that residents spend in outpatient settings appropriately emphasize the importance of adequate ambulatory training during residency.⁶ As the overall curriculum for internal medicine residents expands without a corresponding increase in the total length of training, restructuring existing curricula by creating practical rotations that enu-

merate knowledge and skills to be mastered^{4,18} may improve residents' opportunities to master these skills.

Teachers qualified to precept ambulatory procedures are essential. Academic generalists who perform a full array of ambulatory skills are ideal role models for training physicians who plan a career in general medicine.^{2,7,19} However, such physicians may be scarce.²⁰ It is reasonable to expect subspecialists to teach residents ambulatory procedures during subspecialty rotations, such as flexible sigmoidoscopy during a gastroenterology rotation. Selection of community and HMO staff physicians who commonly perform ambulatory procedures, to serve as preceptors at community-based teaching sites,^{21,22} also may enhance learning opportunities for residents.

Our data seem to indicate that current training requirements and program tracking practices for the surveyed inpatient procedures and clinical examinations have been successful in getting residents to meet specific guidelines for these skills, as set forth by the RRC⁶ and the ABIM.²³ Our findings suggest a different situation for ambulatory procedures, as training programs frequently did not track ambulatory procedures and often lacked a system to certify residents' competency to perform them. Of the ambulatory procedures surveyed, only arthrocentesis of the knee is a procedural skill required by both the RRC and ABIM. Lack of specified training and certification requirements for ambulatory procedures may explain why some of these have such low rates of performance and anticipated "sign-off." Low performance numbers also hold true for the 4 procedures (flexible sigmoidoscopy, treadmill stress testing, endometrial biopsy, and skin punch biopsy) listed by the RRC guidelines as other skills for residents to acquire depending on factors relevant to individual training programs. Establishing a core set of ambulatory procedures and formal methods for granting physicians credentials to perform these procedures may be needed to increase the numbers of physicians-in-training who master them.²⁴

Several limitations of this study are worthy of comment. The response rate was 60% and the total number of respondents was modest. No data were available on those who did not respond, and their practices with regard to procedures and examinations may differ from those of the respondents. No attempt was made to corroborate the self-reported frequencies of performing procedures with data from the medical record. In this regard, we believe physicians who rarely perform procedures are able to give reasonable estimates of the total number performed. This study was limited to a small number of programs, many of which had fewer than 20 residents per class, located primarily in the east. This sample may not reflect practices in other residency programs, especially in areas of the country where penetration of managed care is high. Finally, the study did not examine other factors, such as adequate time in the overall curriculum or availability of facilities, which are necessary to provide adequate training in ambulatory procedures.

In conclusion, internal medicine residents are undertrained to perform many ambulatory procedures despite an increasing need for broadly trained generalist physicians who can manage most of their patients' primary health care needs. Steps to improve training may include developing a consensus of required core ambulatory procedures, tracking residents' performance of these procedures, assessing current learning opportunities, and developing systematic programs so that all residents have opportunities to learn these skills.

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