Research Training in Six Selected Internal Medicine Fellowship Programs

Michael E. Whitcomb, MD, and Deborah L. Walter, MPA

Background: Effective July 1997, the American Board of Internal Medicine (ABIM) established a research pathway to certification to encourage research training of general internists and subspecialists.

Objective: To document the current status of research training in six selected subspecialty programs, to examine opportunities available for trainees to undertake formal course work, and to report the percentage of subspecialty programs that might accept research pathway fellows.


Setting: Programs in internal medicine subspecialties accredited by the Accreditation Council for Graduate Medical Education.

Participants: 1163 (84%) and 1094 (79%) directors of internal medicine subspecialty programs in 1996–1997 and 1997–1998, respectively.

Measurements: Survey questions on the amount of time fellows usually spend conducting research and available opportunities to pursue course work leading to an advanced degree.

Results: On average, during their last year of training, fellows enrolled in infectious disease, nephrology, endocrinology, and rheumatology programs spent 40% to 50% of their time conducting research, whereas fellows in gastroenterology and cardiology spent 25% to 30% of their time conducting research. Compared with programs sponsored by major teaching hospitals, a greater percentage of programs sponsored by academic medical center hospitals planned to accept persons interested in pursuing the new ABIM Research Pathway (28% vs. 8%) and to provide opportunities for fellows to obtain an advanced degree (60% vs. 14%).

Conclusions: Few internal medicine subspecialty programs are currently designed to provide adequate research training as defined by the Institute of Medicine and the ABIM.

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See editorial comment on pp 831-832.

In 1991, the Institute of Medicine established the Committee on Addressing Career Paths for Clinical Research to consider ways to improve the quality of training of clinical investigators and to delineate pathways for persons interested in pursuing careers in clinical investigation. In its 1994 report (1), the Committee noted that relatively few programs adequately prepared physicians to undertake research involving human subjects. The Committee recommended that programs intending to prepare clinical investigators provide at least 3 years of meaningful research training under the supervision of an experienced investigator and offer formal instruction in research-related topics throughout the duration of the program.

Clinical investigators trained in internal medicine are an important sector of the clinical research workforce. In recent years, of the principal investigators in clinical departments who have received NIH grants, 45% of them are full-time faculty in departments of medicine (2). Accordingly, those concerned about the adequacy of the clinical research workforce should be particularly concerned about the research training provided by internal medicine subspecialty residency programs that are largely responsible for preparing internists for careers as clinical investigators.

Recognizing this situation, the American Board of Internal Medicine (ABIM) expressed the view that the percentage of subspecialty fellows training for careers as investigators should be increased (3). This organization therefore established a new research pathway to certification (4) to encourage research training of subspecialists that is consistent with the recommendations of the Institute of Medicine. Fellows who pursue the research pathway will be eligible to take the ABIM certifying examination after completing 2 years of an internal medicine residency program, provided that they also complete 1 or 2 years of clinical training (depending on the subspecialty) in a subspecialty program and a minimum of 3 years of research training under the supervision of an established investigator. According to the provisions of the new ABIM pathway, fellows must spend at least 80% of their time in research during the 3 years of research training and should pursue course work leading to an advanced degree. The ABIM believes that every subspecialty program should be prepared to provide high-quality research training to fellows who wish to pursue the new research pathway.

To gain insight into the challenges facing internal medicine subspecialty programs that wish to adequately
train clinical investigators, we collected information on the current status of research training during residencies in six internal medicine subspecialties. We describe our findings and discuss some of the implications of our findings for the training of clinical investigators in internal medicine.

METHODS

In 1996 and 1997, the Association of American Medical Colleges, in collaboration with the Federated Council for Internal Medicine, conducted the National Study of Graduate Education in Internal Medicine. The study surveyed the program directors of all programs in internal medicine and its subspecialties that are accredited by the Accreditation Council for Graduate Medical Education. It primarily addressed the educational dimensions of internal medicine programs and the career plans of graduates of those programs. The survey instrument included a series of questions on subspecialty research training. We present findings based on data collected for the 1996–1997 and 1997–1998 academic years.

Each year, the National Study of Graduate Education in Internal Medicine survey was mailed to program directors in July; two follow-up survey mailings were targeted to nonrespondents between August and October, and special efforts were made to obtain responses from those who had not returned the survey instrument by November. All responses received by February of the survey year were included in analysis of the survey results.

For data analysis purposes, each program was classified as one of three types based on the nature of the educational environment of the program’s institutional sponsor. A sponsoring hospital was classified as an “academic medical center hospital” if it was under common ownership with a college of medicine, if the majority of medical school department chairs served as the hospital’s chiefs-of-service, or if department chairs were responsible for appointing the hospital’s chiefs-of-service. A sponsoring hospital was classified as a “major teaching hospital” if it was affiliated with a medical school (but less closely than an academic medical center hospital) and sponsored residency programs in at least four specialties. Sponsoring hospitals that did not meet the criteria outlined above were classified as “other hospitals.”

The amount of time devoted to research training and the general nature of the research experience was determined for programs in cardiology, gastroenterology, infectious disease, nephrology, endocrinology, and rheumatology. These subspecialties account for approximately 60% of all subspecialty programs. Pulmonary disease, critical care, hematology, and oncology were not included in the analysis because the structure of the programs in these specialties was evolving into combined pulmonary/critical care and hematology/oncology programs. As a result, it was not possible to make meaningful year-to-year comparisons in these subspecialties.

Because of slight wording differences in some of the questions on the 1996–1997 and 1997–1998 survey instruments, direct year-to-year comparisons are not possible for all of the findings presented. Of particular note, program directors were asked in both years to provide the average percentage of time fellows spent in various clinical and research activities. However, the 1997–1998 survey instrument allowed program directors to distinguish between fellows who spent most of their time in clinical settings (clinical track) and fellows who spent the majority of their time conducting research (research track). It must be

<table>
<thead>
<tr>
<th>Sponsoring Hospital</th>
<th>All Programs</th>
<th>Responding Subspecialty Programs (of All Responding Programs)</th>
<th>Fellows Enrolled in Responding Subspecialty Programs</th>
<th>Average F1–F5 Fellows per Responding Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>n (%)</td>
<td>n</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Academic medical center</td>
<td>914</td>
<td>935</td>
<td>785 (67)</td>
<td>760 (69)</td>
</tr>
<tr>
<td>Major teaching</td>
<td>409</td>
<td>383</td>
<td>336 (29)</td>
<td>293 (27)</td>
</tr>
<tr>
<td>Other</td>
<td>54</td>
<td>59</td>
<td>42 (4)</td>
<td>41 (4)</td>
</tr>
<tr>
<td>Unknown</td>
<td>66</td>
<td>20</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Total</td>
<td>1443</td>
<td>1397</td>
<td>1163 (100)</td>
<td>1094 (100)</td>
</tr>
</tbody>
</table>

Table 1. Comparison of the Number of Internal Medicine Subspecialty Training Programs and Fellows in 1996–1997 and 1997–1998, by Sponsorship Category
emphasized that the research track referenced in our study should not be construed as the ABIM Research Pathway Program.

RESULTS

For 1996–1997 and 1997–1998, 1163 (84%) and 1094 (79%) program directors in internal medicine subspecialties returned the survey instrument. Table 1 shows the number of responding subspecialty programs in each of the sponsorship categories and the number of fellows enrolled in those programs. Approximately two thirds of subspecialty programs were sponsored by an academic medical center hospital; these programs educated approximately 75% of all fellows in both survey years. Since programs sponsored by other hospitals accounted for a small percentage (4%) of all subspecialty programs, we focus on findings from programs sponsored by academic medical center hospitals and major teaching hospitals. Table 2 shows the total number of programs and number of programs in the six subspecialties that responded to the survey.

Figure 1 shows the proportion of programs that planned to accept persons interested in pursuing the new ABIM Research Pathway during 1998–1999 and 1999–2000. Of note, 28% of the programs sponsored by an academic medical center hospital planned to accept persons interested in pursuing the new ABIM Research Pathway, a much higher percentage of those sponsored by academic medical center hospitals (60%) than of those sponsored by major teaching hospitals (14%) planned to provide opportunities for fellows to obtain an advanced degree (Figure 1).

In 1997–1998, 25% of subspecialty programs (90% of

Table 2. Internal Medicine Subspecialty Training Programs in 1996–1997 and 1997–1998

<table>
<thead>
<tr>
<th>Subspecialty Program</th>
<th>Total Programs</th>
<th>Responding Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular disease</td>
<td>199</td>
<td>189</td>
</tr>
<tr>
<td>Endocrinology, diabetes, and metabolism</td>
<td>130</td>
<td>125</td>
</tr>
<tr>
<td>Gastroenterology</td>
<td>170</td>
<td>167</td>
</tr>
<tr>
<td>Infectious disease</td>
<td>142</td>
<td>140</td>
</tr>
<tr>
<td>Nephrology</td>
<td>135</td>
<td>129</td>
</tr>
<tr>
<td>Rheumatology</td>
<td>107</td>
<td>106</td>
</tr>
<tr>
<td>Subtotal</td>
<td>883 (61)</td>
<td>856 (61)</td>
</tr>
<tr>
<td>Combined programs*</td>
<td>400 (28)</td>
<td>378 (27)</td>
</tr>
<tr>
<td>Other†</td>
<td>160 (11)</td>
<td>163 (12)</td>
</tr>
<tr>
<td>Total</td>
<td>1443</td>
<td>1397</td>
</tr>
</tbody>
</table>

* Includes pulmonary disease, critical care, hematology, oncology, pulmonary/critical care medicine, and hematology/oncology.
† Includes clinical cardiac electrophysiology, geriatric medicine, and sports medicine.

Considerably more programs sponsored by academic medical center hospitals or major teaching hospitals that accepted fellows interested in the American Board of Internal Medicine (ABIM) Research Pathway and provided opportunities to pursue formal course work leading to an advanced degree in 1998–1999 and 1999–2000.
which were sponsored by an academic medical center hospital) had separate clinical and research tracks. Although the National Study of Graduate Education in Internal Medicine survey did not specifically request data on the number of fellows in the research track, the ABIM estimates that about 400 trainees in postgraduate year 2 to 3 are currently in the research pathway. Approximately one third of the programs that had a separate research track planned to accept persons interested in pursuing the new ABIM Research Pathway. In contrast, only 16% of programs without a separate research track planned to accept such persons (Table 3).

Subspecialty programs are accredited for 2 or 3 years of training, depending on the subspecialty. Approximately 95% and 87% of program directors who responded in 1996–1997 and 1997–1998, respectively, indicated that fellows participated in research during the last year of training. Figure 2 shows the average percentage of time devoted to research training in the various subspecialties for programs that did not have separate clinical or research tracks. On average, fellows enrolled in infectious disease, nephrology, endocrinology, and rheumatology programs spent 40% to 50% of their time conducting research in the last year of the program (year 2). Fellows in gastroenterology and cardiology spent, on average, 25% to 30% of their time conducting research in the last year of the program (year 3).

One fourth to one half of the programs in cardiology, gastroenterology, infectious disease, nephrology, and endocrinology offered additional years of training for fellows interested in advanced clinical or research experiences. Fewer than 2% of the programs in each of these subspecialties offered as many as 3 additional years of advanced training. The average percentage of time spent conducting research during the advanced years increased progressively for each year of training. On average, fellows in the first additional year of training spent approximately 50% of their time conducting research, whereas fellows in the third year of advanced training spent as much as 85% of their time doing research. Also of note is that the percentage of time that second-year fellows spent conducting research between 1996–1997 and 1997–1998 declined in the majority of specialties that we examined.

Figure 3 shows the distribution in the percentage of time devoted to research training in the various selected subspecialties for programs that reported a separate clinical or research track in 1997–1998 (the 1996–1997 survey instrument did not make such a distinction) compared with programs that did not report separate tracks. (For comparative purposes, not all programs included in Figure 2 were included in Figure 3.) Although the percentage of time spent doing research varied somewhat among subspecialties, fellows in programs offering separate clinical and research tracks usually spent more time conducting research than did fellows in programs that did not have separate tracks. For example, in 50% of subspecialty programs in gastroenterology, infectious disease, nephrology, and rheumatology that had a separate research and clinical track, second-year fellows spent at least 45% of their time conducting research. In contrast, second-year fellows spent much less of their time conducting research in 50% of programs in these same subspecialties that did not have separate research and clinical tracks.

Among the top 25% (above the 75th percentile) of programs in gastroenterology, infectious disease, nephrology, and rheumatology, the percentage of time that second-year fellows spent conducting research differed little, regardless of whether programs had separate tracks. By the third year, most cardiology and gastroenterology programs that offered a separate research track provided con-

Table 3. Programs That Planned To Accept Persons Interested in Pursuing the ABIM Research Pathway during 1998–1999 and 1999–2000*

<table>
<thead>
<tr>
<th>Type of Program</th>
<th>Planned To Accept</th>
<th>Did Not Plan To Accept</th>
<th>Not Sure</th>
<th>Unknown</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separate clinical and research tracks</td>
<td>103 (37)</td>
<td>31 (11)</td>
<td>146 (52)</td>
<td>1 (0)</td>
<td>281 (25.6)</td>
</tr>
<tr>
<td>No separate clinical and research tracks</td>
<td>128 (16)</td>
<td>268 (34)</td>
<td>386 (49)</td>
<td>12 (1)</td>
<td>794 (72.6)</td>
</tr>
<tr>
<td>Unknown</td>
<td>6 (32)</td>
<td>5 (26)</td>
<td>6 (32)</td>
<td>2 (10)</td>
<td>19 (1.7)</td>
</tr>
<tr>
<td>All</td>
<td>237</td>
<td>304</td>
<td>538</td>
<td>15 (1.4)</td>
<td>1094</td>
</tr>
</tbody>
</table>

*ABIM = American Board of Internal Medicine.
siderably more time for fellows to conduct research than did programs without separate research tracks. For example, fellows spent 30% to 45% of their time conducting research in one fourth (25th percentile) to one half (50th percentile) of cardiology programs with separate tracks, compared with an average of 5% to 15% of fellows’ time devoted to research in programs without a separate research track.

DISCUSSION

The ABIM established research training requirements that subspecialty programs must meet for their trainees pursuing the research pathway to be eligible for certification in internal medicine. Analysis of data from the National Study of Graduate Education in Internal Medicine surveys conducted in 1996–1997 and 1997–1998 provides some insight into the challenges training programs will face in conforming to these requirements.

The average percentage of time that fellows spent conducting research during their last year of required training was substantially less than the 80% time commitment required by the new research pathway. In four of the six disciplines we examined, fellows spent an average of 40% to 50% of their time conducting research in the last year of training; in cardiology and gastroenterology, the two largest and most procedurally oriented disciplines, fellows spent even less time conducting research. However, it is possible that the total time fellows spend conducting research is similar among all disciplines but is less intensive in any given year for fellows in cardiology and gastroenterology because the duration of their training is longer—3 years compared with 2 years for infectious disease, nephrology, endocrinology, and rheumatology programs.

Fewer than 2% of programs offered three additional years of advanced research training as required by the ABIM Research Pathway; of those, the percentage of time

Figure 2. Duration and intensity of fellows’ research activities in 1996–1997 and 1997–1998 in six internal medicine subspecialties.
that fellows spent doing research also was considerably less than the 80% requirement of the research pathway. The decline in the average percentage of time that fellows spent conducting research between the 2 years seems to be consistent with data reported by the ABIM, which uses a form to independently track research training in subspecialties. Collectively, these findings may suggest a downward trend in the amount of research being done in training programs accredited by the Accreditation Council for Graduate Medical Education. In addition, only about half of the directors of subspecialty programs who indicated that they might accept research pathway fellows into their program indicated that trainees could undertake formal course work leading to a master’s or a PhD degree in basic or clinical science during their subspecialty training. These programs were predominantly in infectious disease (16%), cardiovascular disease (13%), and rheumatology (12%). Our data suggest that of the 1400 internal medicine subspecialty programs in the United States in 1997–1998, only about 170 may be prepared to provide training that would comply with the new ABIM Research Pathway requirements (1, 5, 6).

Our findings suggest that programs will have a difficult time providing research training that is consistent with...
the ABIM requirements. This is the case even for programs that already have established a separate research track and are presumably better positioned to respond to the research pathway requirements leading to ABIM certification. Although fellows enrolled in programs that offered a distinct research track spent a greater percentage of time conducting research than did fellows in programs that did not have a separate track, this amount of time did not approximate the time required by the new research pathway. In addition, relatively few programs seem to have separate research tracks, and approximately half of the responding programs that offer a separate research track do not provide opportunities for fellows to pursue course work leading to an advanced degree.

The ABIM had hoped that about 10% of fellows entering subspecialty training would enter the new pathway (Langdon L. Personal communication. 13 August 1999). However, program directors reported that fewer than 2% (approximately 104) of second-year residents in categorical residency programs actually entered the research pathway in July 1999. These residents were usually enrolled in categorical programs sponsored by research-intense institutions; 80% of these institutions are included in our results. Although the pathway does provide opportunities for interns to move into a subspecialty 1 year earlier (the trade-off being 2 more years of required subspecialty training), the ABIM is not in a position to influence the numbers of residents interested in research.

We do not know why so few fellows are entering the program. A survey of resident physicians may yield data that would provide insight into this issue. The value of 2% may slightly underestimate the actual number of trainees simply because program directors fail to report all of the fellows in the pathway, despite diligent efforts by the ABIM to collect this information. The relatively small number of trainees entering the pathway also may be due in part to a lack of awareness among program directors of the existence of the ABIM Research Pathway. Furthermore, the research pathway is advantageous only to residents who wish to skip a year of training in general internal medicine. Persons who want to complete clinical training in general internal medicine and desire a research career are better off following the traditional ABIM training pathway and adding research experience beyond that required for certification. Traditionally, this has been the standard practice.

Internal medicine programs also must fulfill specific requirements to be recognized as having an ABIM Research Pathway Program. For example, in addition to offering formal course work leading to a PhD degree or equivalent advanced degree in the field of investigation, a program must establish a research environment with adequate funding available and ensure a critical mass of productive researchers, including mentors having a sustained record of research funding. Mentors are expected to be extensively involved in supervising and documenting the progress of research trainees according to established training goals. These requirements may prove much more difficult for some programs to meet than for others. In an evolving health care marketplace in which faculty members appear to be spending more time in patient care to maintain their incomes and to help the school maintain its level of clinical revenues, the availability of faculty to teach and conduct research may be increasingly compromised.

Our findings provide no insight into the demand among resident physicians enrolled in internal medicine residency programs or medical school graduates entering those programs for the kind of research training required by the ABIM Research Pathway. The experience to date suggests that the demand will not be great; however, since the Research Pathway is new, it is too early to reach a definitive conclusion. Perhaps by focusing additional attention on the need to train more clinical researchers, the new Institute of Medicine Roundtable on Clinical Research will stimulate more internal medicine residents to seek out opportunities to pursue the ABIM Research Pathway.

However, our findings do not provide insight into how many directors of internal medicine and subspecialty programs might modify their programs to provide opportunities for residents who wish to pursue the ABIM Research Pathway. The Research Pathway was announced in 1997, and our data reflect the status of research training in subspecialty programs before the new pathway would have affected the design of those programs. Our intent was to gain insight into the challenges that program directors who wished to offer the new pathway would face in modifying their programs.

Interpretation of our results is limited by two methodologic factors. First, the decision to exclude several types of subspecialty programs, including all of the combined programs (for example, hematology/oncology), may have resulted in underestimation of the average percentage of time that fellows may actually spend conducting research. It may be that research opportunities are greater in some of the excluded programs, such as oncology. However, on the
basis of personal experience, we doubt that this is the case. Second, it should also be noted that the response rate to the survey, while high, was not 100%. It is possible that the structure of training in programs that did not respond differs fundamentally from that in programs that did respond.

CONCLUSIONS

The results reported here are intended to provide insight into the nature of the research training provided by subspecialty programs in internal medicine. The current structure of subspecialty training programs in internal medicine does not meet the requirements of the new ABIM Research Pathway, which are based largely on recommendations of the Institute of Medicine. For the majority of subspecialty programs, the duration and intensity of the research experience available to fellows are limited compared with the requirements outlined by the ABIM, and there are no established arrangements that will enable trainees to pursue course work leading to an advanced degree. Our observations suggest that subspecialty training program directors will face formidable challenges in restructuring their programs if they hope to provide opportunities for persons who are interested in pursuing the ABIM Research Pathway to certification. It seems highly unlikely that the hope on the part of ABIM that even a small majority of subspecialty programs will be prepared to offer the new pathway will be realized.

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References