

A Suggested Fourth-year Curriculum for Medical Students Planning on Entering Family Medicine

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Background: *Students interested in a family medicine residency often seek advice about what electives to take in their final year of medical school. This study sought to develop a consensus about what rotations to recommend and what essential skills students should possess before starting their family medicine residency.* **Methods:** *We conducted Delphi studies with panels of experienced community- and university-based family medicine residency directors and predoctoral educators in departments of family medicine at US medical schools. Each group participated in a three-phase Delphi process that asked each member to identify potential rotations and skills and then narrowed the list to those of the highest priority.* **Results:** *Both the residency directors and predoctoral educators recommended that students participate in an ambulatory family medicine month in their fourth year of medical school, along with electives in emergency medicine, dermatology, obstetrics, and an acting internship (subinternship) in internal medicine. While there was some divergence in the panel's opinions, both panels felt that superior interviewing skills, the ability to manage undifferentiated problems, and the interpretation of common imaging studies were essential skills that students should have before entering a family medicine residency.* **Conclusions:** *Experienced family medicine educators appear to agree that students benefit most from a few specific rotations during the final year of medical school. This information may be useful to faculty members who advise students during medical school.*

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Over the past 3 decades, both the purpose and the content of the fourth year of medical school have concerned medical school curriculum planners. At one time, several schools went as far as to reduce the length of medical school training to 3 years because the role of the fourth year was so elusive.¹ Although students in the 3-year curricula had similar outcomes to those of the traditional 4-year curricula,^{2,3} most schools abandoned the shorter 3-year training programs to provide students with the opportunity to obtain a broader perspective on medicine that the fourth year can provide.⁴ Yet, there is some evidence that students may not be choosing a diverse program of study in their fourth-year electives.

In most medical schools, students exercise a great deal of discretion over the content of their last year of training. Given the luxury that this flexibility provides, students adopt different strategies to reach different goals. One strategy, described as the "pre-residency syn-

drome," springs from students' preoccupation with getting into the residency of their choice.⁵ Students load up their schedules with multiple electives in their chosen field of study and do not obtain the breadth of experience that program directors, chairs, and even current residents would recommend.^{6,7} Another feature of this strategy is a reliance on "audition" electives in which the students do the same rotation at several sites in an attempt to distinguish themselves and outperform other applicants. This phenomenon has become popular in fields such as surgery, obstetrics-gynecology, and some surgical subspecialties, despite evidence that multiple auditions actually may be counterproductive.⁸

To address the dilemma about what elective rotations would be most useful for students entering specific fields, several disciplines such as plastic surgery,⁹ ophthalmology,¹⁰ general surgery,⁷ and obstetrics-gynecology¹ have sought advice from seasoned educators. Most of these groups recommend balanced elective choices in the fourth year of medical school, with few electives dedicated to the student's future career choice. To our knowledge, there has been little research examining

what electives would be most valuable for students who wish to enter family medicine. Advising students interested in family medicine can be challenging because of the breadth of the discipline and the potential for so many rotations to be perceived as valuable.

This study developed a consensus about the optimal fourth-year experience for students entering a family medicine residency. We chose to examine this issue from multiple perspectives, including those who advised students about what to do in their fourth year (predoctoral educators at medical schools) and those who had expectations about the capabilities of students after they complete their fourth year of medical school and enter a residency program (residency directors).

Methods

Survey Methodology

We performed a separate Delphi survey for both the residency directors and the predoctoral educators. The reason for performing two separate studies rather than combining the respondents into one group was to explore the issues from different perspectives.

The Delphi technique is an iterative process featuring sequential surveys of key respondents or opinion leaders that progresses from relatively undefined responses to a consensus.¹² The Delphi method was developed in the late 1940s by researchers from the RAND Corporation and relies on anonymous responses from expert opinion leaders to reach a consensus. It has been used in several areas of investigation ranging from psychiatry¹³ to community health¹⁴ to family medicine,^{15,16} including issues of curriculum development and content.^{17,18}

Each Delphi survey consisted of an initial round of open-ended responses to the following question: "Please list up to 10 fourth-year electives that you believe are most useful to medical students who are entering a residency program in family medicine and the core skills that you believe they should acquire during that rotation (eg, elective: radiology; core skills: be able to interpret chest X rays and abdominal films)." These results were collated and returned to the respondents under two headings: rotations suggested and core skills identified. In the second round of our Delphi process, panel members were then asked to identify 10 to 20 rotations and 20 to 30 core skills that they thought should remain on the list. Rotations or skills that were not identified on any response were deleted, and a final list of suggested rotations and skills was sent to respondents asking them to place in rank order their top five choices for essential rotations. Each of the rotations was ranked using a reverse-order scoring system (five points for the first-ranked rotation, four points for the second-ranked rotation, etc). A similar process was used to rank the top 10 skills. Then, sums of the individual responses were calculated based on a reverse scoring system, with

10 points assigned for the top-ranked skill, nine points for second-ranked skill, etc.

Survey Sample

Our intention was to identify a group of residency directors who had sufficient experience with many residents and an ability to represent the general opinions of residency directors. To do this, we reviewed the *2002 Directory of Family Practice Residency Programs* and identified family medicine residency directors who had more than 10 years of experience and/or who had held leadership positions in the American Academy of Family Physicians, Association of Family Practice Residency Directors, American Board of Family Practice, or Society of Teachers of Family Medicine. From this initial list, we selected 20 potential participants who would provide balanced geographic representation of the United States. Sixteen of the initial 20 invited directors participated in at least one part of the process while 14 directors participated in all three phases of the survey. Of the respondents, five were directors of programs in the Northeast, four from the West/Southwest, four were from the Midwest, and three from the South. Twelve directors headed community-based residency programs while the remaining four respondents directed university-based residency programs. One of the community-based program respondents was the director of a rural training track after having previously been residency director at a university residency program. None of the respondents was affiliated with the military. While we did not inquire about specific demographics of the respondents, four of the respondents were women (21%).

In addition, a panel of experienced predoctoral educators in departments of family medicine at US allopathic medical schools were invited to participate. Although turnover in this position is fairly common, we attempted to invite those who had been predoctoral directors for 5 years or more. In addition, those who were active in national organizations similar to those listed above also were invited. This effort produced a final sample in which 80% of the participants had been directors for greater than 5 years. Twenty-two of the 30 invited educators participated in at least one phase of Delphi survey, and 17 participated in all three phases. Participants included six each from the West, Midwest, and Northeast, along with four from institutions in the South. Seven (32%) of the sample were women.

Data Analysis

Since the purpose of this study was exploratory, we limited our analysis to the frequencies in which rotations and skills were reported on the final consensus survey of both groups. Because the perspective of residency directors and predoctoral educators differs, we chose to examine the responses of each group sepa-

rately. Also, due to the small sample size and qualitative nature of the study, we did not compare the responses of the two groups using inferential statistics.

Results

Overall, residency directors identified 21 rotations that at least one director thought should be in the top five recommendations for students. Predoctoral educators identified 35 rotations that were ranked by at least one respondent.

Rotations

Table 1 shows the highest priority rotations, in rank order, that residency directors and predoctoral educators recommended for fourth-year students. Ambulatory family medicine was a high priority for both groups of educators, with emergency medicine, dermatology, obstetrics, and an internal medicine acting internship appearing among the top 10 rotations for both groups. From the sum of the rank scores, it was clear that residency directors most favored an internal medicine acting internship and ambulatory medicine experience, with the other rotations assigned a lower priority. The predoctoral educators appeared to agree that ambulatory family medicine was very important, while there was less agreement for other rotations.

Skills

When we examined the skills that students were expected to have upon graduation, we received a wide range of responses. Predoctoral educators ranked 59 items while the residency directors identified 41 items that were considered an essential skill or knowledge area for students to have before starting their residency. When we examined the highest-ranked items in more detail, it was clear that these high-priority areas clustered into three domains: data-gathering skills, patient management skills, and procedural skills.

The highest priority skills that the residency directors and predoctoral educators identified are shown in Table 2. Among predoctoral educators, developing a management plan that includes psychosocial factors was rated highly by nearly every predoctoral educator. Residency directors identi-

fied three skills of very high priority: learning how to perform a pelvic examination, improving interview skills, and learning how to handle undifferentiated problems.

There was some agreement between the groups that advanced interviewing skills with patients and parents were very important for students to have achieved before graduation. One notable contrast between the skills identified by the predoctoral educators and residency directors was that the former emphasized medical history-taking skills while the residency directors placed a high value on achieving competency in several areas of the physical examination.

Discussion

By using the Delphi technique, we were able to gain some consensus of predoctoral educators and residency directors with regard to the most important rotations that they feel students who are planning on entering family medicine should take during their fourth year of medical school. Both panels assigned high priority to ambulatory family medicine and internal medicine acting internship. There was agreement that other rotations such as emergency medicine, dermatology, and obstetrics also were important, but these were not as high a priority as ambulatory family medicine and the internal medicine acting internship.

The two expert groups identified some key skills for students aspiring to enter family medicine. Skills that were assigned the highest priority included developing management plans that include psychosocial factors,

Table 1

Highest Priority Fourth-year Rotations Suggested by Residency Directors and Predoctoral Educators for Students Interested in Family Medicine

<i>Predoctoral Educators</i> ¹	<i>Residency Directors</i> ²
Ambulatory family medicine (25)	Internal medicine acting internship (36)
Health promotion/disease prevention (17)	Ambulatory family medicine (31)
Emergency medicine (15)	Dematology (18)
Orthopedics/sports medicine (14)	Evidence-based medicine (15)
Family-centered maternity care (13)	Ambulatory pediatrics (14)
Medical problem solving (13)	Emergency medicine (11)
Inpatient family medicine (12)	Gynecology (11)
Dematology (11)	Communications/ethics (9)
Radiology (10)	Infectious disease (6)
Cardiology (9)	Community medicine (5)
Clinical pharmacology (9)	Ophthalmology (5)
Geriatrics (9)	Obstetrics (5)
Intensive care rotation (9)	
Internal medicine acting internship (9)	
Research, community, or service project (9)	

1—Numbers in parentheses indicate total score assigned by panel of 17 respondents, with scoring based on the sum of responses assigning 5 points to the highest priority, 4 points to the second-highest priority, etc.

2—Numbers in parentheses indicate total score assigned by panel of 14 respondents with scoring based on the sum of responses assigning 5 points to the highest priority, 4 points to the second-highest priority, etc.

learning how to perform a pelvic examination, improving interview skills, and learning how to handle undifferentiated problems assigned the highest priority. Compared to the agreement on lists of rotations, the opinions of predoctoral educators and residency directors diverged in the area of skills. Predoctoral educators tended to identify broader categories of skills such as “develop comprehensive, cost-effective, and practical therapeutic plans,” while the residency directors were more likely to identify specific skills such as individual components of the physical examination or “learn how to manage chest pain.” One explanation for the greater difference observed in the recommendations for needed skills may relate to different perspectives of predoctoral educators and residency directors. Predoctoral directors may direct and teach courses that address broad learning objectives, whereas residency directors must deal with the negative ramification of specific decisions made by junior residents. Also, in contrast to residency directors, who receive the “finished products” of medical schools, predoctoral directors initially encounter students who have few skills and may have based their skill development priorities on the needs of these “undeveloped” students.

Scheduling of fourth-year rotations can be perplexing to fourth-year medical students. However, students electing to enter family medicine may have an especially difficult time with this choice because of the breadth of the discipline. The recommendations generated from this study, comprising the consensus of leaders in family medicine, will assist predoctoral educators, residents, and other faculty in advising these students about their choice of fourth-year rotations. This may result in graduating medical students with better preparation for residency and their ensuing careers.

Previous research in the fields of surgery, ophthalmology, and obstetrics-gynecology has recommended curricula for fourth-year students entering these fields.^{7,10,11} The rotations recommended by our panels differ from those of these other specialties, emphasizing the importance of a tailored fourth-year curriculum. Recommendations for general surgery and ophthalmology residents emphasized rotations that would be useful in those disciplines, including anatomy, pathology, cardiology, neurology, intensive care, and anesthesiology. Faculty in obstetrics-gynecology emphasized a broad, general medical background and recommended a core curriculum including internal medicine,

Table 2

Most Commonly Cited Skills That Graduating Students Should Have Before Becoming Residents

Predoeal Educators¹

- Perform problem-focused history, physical, and assessment (39)
- Elicit from patients the meaning of the disease to them and to their families (30)
- Perform an appropriate health maintenance examination based on age, sex, family history, occupation, risk factors (28)
- Demonstrate advanced communication skills, including counseling, negotiation, etc (23)
- Elicit a psychosocial history (13)

Data-gathering Skills

Residency Directors²

- Learn how to do a pelvic examination (81)
- Improve interviewing skills (76)
- Learn better interviewing skills with parents (35)
- Listen to murmurs (21)
- Learn better examination of joints (20)

Medical Management Skills

- Develop a management plan that includes psychosocial factors (71)
- Care for patients with undifferentiated problems (42)
- Admit and manage patients with the 15 most common reasons for hospitalization (33)
- Develop comprehensive, cost-effective, and practical therapeutic plans (27)
- Develop patient education strategies to facilitate patient lifestyle changes (25)
- Learn how to handle undifferentiated problems (73)
- Learn how to manage pediatric outpatient and wellness visits (36)
- Know how to use a personal digital assistant and electronic medical record (31)
- Know how to evaluate chest pain (25)
- Be efficient in the management of common outpatient problems (22)

Procedural Skills

- Assist in common office procedures (14)
- Interpret electrocardiograms (12)
- Perform uncomplicated deliveries (12)
- Interpret basic imaging studies (11)
- Learn CPR/ACLS (46)
- Have suturing skills (20)
- Be able to interpret chest radiographs (20)

1—Numbers in parentheses indicate total score assigned by panel of 17 respondents with scoring based on the sum of responses assigning 10 points to the highest priority, 9 points to the second-highest priority, etc.

2—Numbers in parentheses indicate total score assigned by panel of 14 respondents with scoring based on the sum of responses assigning 10 points to the highest priority, 9 points to the second-highest priority, etc.

CPR—cardiopulmonary resuscitation
 ACLS—Advanced Cardiac Life Support

family medicine, intensive care, general surgery, and neonatology. Each of these disciplines, similar to our results for family medicine, recommended one rotation within their own specialty, although it was noted that 30% of the obstetrics-gynecology faculty surveyed did not recommend any rotations in obstetrics-gynecology. According to expert recommendations from several disciplines, the decision to enter a particular field should, therefore, result in a distinctive fourth-year schedule of rotations.

Limitations

One limitation of our study is that it does not include the perspective of recent graduates of medical school. It is possible that both predoctoral educators and residency directors have overlooked rotations or skills that residents believe are more helpful than those identified by the predoctoral and residency directors. Future studies seeking the consensus of these recent graduates would be valuable in that they might highlight what residents found to be useful from the fourth year.

Another limitation of this study is that required medical school curricula can vary. Emphasis on care of specific populations and communities can differ. The context of the clerkships can vary greatly from urban to rural and from outpatient to inpatient. Some schools have no required family medicine clerkships, and some have longitudinal clerkships that span more than 1 year. Consequently, the type of experience obtained during a clerkship will leave different needs that should be addressed with fourth-year clerkships. For that reason, educators should consider the skills identified in this study in the context of the previous clerkship experience for their students, rather than focusing exclusively on the electives recommended by our panels. To be used most effectively, every medical student advisor should adapt these panels' recommendations to his/her own particular institution.

Conclusions

In summary, our panels appear to agree that third-year medical students seeking to enter family medicine should plan a broad array of fourth-year electives. Elective time should include ambulatory family medicine, an internal medicine acting internship, and, perhaps, rotations in dermatology, emergency medicine, and obstetrics. Our panels indicated a broad range of skills that students should aim to acquire in the fourth

year as a solid base for a family medicine career. Students and advisors can use this skill list as a guide and compare these to the student's perceived need for additional experience in these areas when discussing fourth-year elective programs.

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