

## Educational Research and Methods

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# Unique Learning Contributions of a Family Medicine Preceptorship

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**Background:** *There is a belief among family medicine educators that a third-year family medicine rotation provides unique clinical learning experiences, but there is limited research to support this belief. This study identified clinical skills performed by third-year medical students only during a community-based family medicine preceptorship, even when the family medicine rotation occurs after all other required clerkships.* **Methods:** *During 6 academic years (1990–1996), 87 third-year students completed the family medicine preceptorship as their final rotation and rated their experience with 80 clinical activities (preventive health care, clinical problem management, and procedures) after completing all required clerkships other than family medicine and again after the family medicine preceptorship. Ratings measured whether the activities occurred on the family medicine rotation, only on other rotations, or combinations of both.* **Results:** *More than 50% of students who performed five preventive skills (health maintenance for adolescents, young adults, middle-aged adults, or senior citizens and weight control counseling) gained that experience only during the family medicine preceptorship. The majority of students actively managed six clinical problems (acute strains and sprains, low back pain, sinusitis, strep throat, acute bronchitis, and osteoarthritis) uniquely during the family medicine preceptorship. The preceptorship offered few unique opportunities to perform procedures.* **Conclusions:** *This family medicine educational experience was not merely a repeat of what is experienced on the traditional major rotations. The family medicine preceptorship provided a setting where students were able to perform several important ambulatory, primary care skills they had not performed during their core curriculum of traditional third-year rotations.*

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Many reasons have been suggested to support a required family practice experience for medical students, such as encouraging students to pursue a career in primary care. However, there is also a belief among family medicine educators that such a rotation provides a unique clinical learning experience.<sup>1,2</sup> Little data exist to support such a claim.

Michener et al addressed this question in 1986 when they reported on the experience gained during a 2-month family medicine clerkship that occurred at the end of the third year at Duke University.<sup>3</sup> The Duke clerkship contained both didactic and clinical experiences. Thirty-six students were given a list of skills and asked to report if they had acquired each skill

prior to or during their family medicine clerkship. From these responses, the authors identified skills that the students learned only during their family medicine rotation. That study reported valuable information, but it was not clear how many of the self-reported skills reflected information presented to students in lectures or activities that students saw others perform, in contrast to skills that the students themselves actively practiced with patients.

Our study was designed to determine what a community-based, third-year family medicine rotation contributed to the education of third-year medical students when the rotation came after students had taken all other required clerkships.

## Methods

### Program Description

In the medical school curriculum during the 6 academic years of this study (1990–1996), third-year medical students at the University of Iowa were

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required to complete clinical rotations in internal medicine (9 weeks), OB-GYN (6 weeks), pediatrics (6 weeks), psychiatry (6 weeks), surgery (6 weeks) and medical subspecialties (2 weeks each of anesthesia, dermatology, neurology, orthopedics, and urology), and a community-based family medicine preceptorship that increased from 2 to 3 weeks in duration in 1993. Student rotations followed a sequential order, and students could request their starting rotation. With the exception of OB-GYN and dermatology, the other clerkships were primarily inpatient based, with a few scheduled ambulatory experiences.

During the family medicine preceptorship, students went to communities across Iowa to work one-on-one with a board-certified family physician in an apprenticeship model, working with the preceptors as they cared for patients in the office, hospital, and nursing home. Other family medicine preceptorship student activities included interacting with office personnel, attending hospital staff meetings, participating in community activities, and sometimes staying at the preceptor's home. Family medicine preceptorship students had assigned readings and a final exam but no formal didactic teaching, except for a 1-day, on-campus orientation that started in 1994. The preceptorship objectives and readings stressed prevention, management of common diagnoses, and basic procedural skills. Over the 6 academic years (1990–1996) studied, 974 students completed the third year of medical training, and 87 of these students had family medicine as their final rotation (May or June).

### Evaluation

In evaluating the family medicine preceptorship, we sought to identify information about students' active learning experiences. To capture such information, we reviewed the literature on the content of primary care<sup>4,5</sup> and developed a checklist of 80 primary care clinical skills. These could be categorized in three groups: 10 prevention/patient education skills, 31 clinical diagnostic or management skills, and 39 procedural skills.<sup>6</sup> Students were asked to report their level of involvement with each skill on a five-category scale (not encountered, observed preceptor address problem, assisted preceptor in addressing problem, managed problem with supervision one or two times during preceptorship, or managed problem with supervision three or more times during the preceptorship). We subsequently converted that information to a yes/no scale in which the "yes" indicated that the student actively managed or performed the item one or more times under preceptor supervision. Our main interests were curriculum evaluation and tracking student opportunities to perform the listed skills.<sup>7</sup>

The checklist that students completed at the beginning of the preceptorship told us their cumulative

learning from all other required third-year clerkships. The checklist they completed at the end of the preceptorship allowed us to determine the added value or the unique learning contribution of the family medicine preceptorship. Forms were given to students when they left campus. Students were required to submit the assessment and evaluation forms after the family medicine preceptorship, although the information was not considered in assigning grades.

Students' experiences were judged, based on responses before and after checklists, to fall into one of the following categories: 1) not done, meaning that the item was not performed during any third-year rotation, 2) prior only, meaning that students actively managed the item only on rotations before the family medicine rotation, 3) both, indicating that the item was actively managed during the family medicine rotation and prior clerkship rotations, or 4) FMP only, meaning that the item was managed only on the family medicine rotation. *Unique learning* referred to learning experiences that only occurred in the family medicine rotation. When 50% of students identified the item as experienced only during the family medicine preceptorship, the item was categorized as unique learning on the family medicine preceptorship. For several items, the preceptorship did not provide more than 50% of the students with unique learning, but it still provided learning experience for more students than all prior rotations. For example, for the skill "well-child care—birth to 12 years" the family medicine preceptorship provided unique learning experience to only 29% of students, but the total number of students who performed the skill during the preceptorship was greater than the number who performed the skill on prior rotations. These items were identified as *substantial learning and reinforcement*.

In 1996, students were asked to answer the following open-ended question at the time of their family medicine preceptorship exam: "Think about your family medicine preceptorship in relation to all of your other third-year clerkships to date. What unique learning experiences did you have on your preceptorship as compared with all other rotations to date during your third year?" All data are presented as descriptive statistics.

### Results

#### *Prevention/Patient Education Skills*

Information about student performance on prevention and patient education skills is shown in Table 1.

**Unique Learning.** More than 50% of third-year students who performed prevention skills with adolescents, young adults, middle-aged adults, and senior citizens, and who provided patient education about weight control, did so only during the family medicine preceptorship. For all five of these prevention

Table 1

## Prevention/Patient Education Skills Where the Family Medicine Preceptorship Provided Unique or Significant Learning Contributions\*

<i>Prevention/Patient Education Skills</i>	<i>Not Done</i>	<i>Prior Only</i>	<i>Both</i>	<i>FMP Only</i>	<i>% FMP Only</i>
<b>Preventive health care for a senior citizen age 65 and over (n=86)</b>	<b>33</b>	<b>2</b>	<b>16</b>	<b>35</b>	<b>66</b>
<b>Preventive health care for an adolescent age 13 to 18</b>	<b>40</b>	<b>3</b>	<b>13</b>	<b>31</b>	<b>66</b>
<b>Preventive health care for a middle-aged adult age 40 to 64</b>	<b>30</b>	<b>3</b>	<b>17</b>	<b>37</b>	<b>65</b>
<b>Preventive health care for a young adult age 19 to 39</b>	<b>30</b>	<b>6</b>	<b>14</b>	<b>37</b>	<b>65</b>
<b>Weight control</b>	<b>41</b>	<b>6</b>	<b>14</b>	<b>26</b>	<b>57</b>
Smoking cessation	30	12	20	25	44
Obtain history on activities of daily living from a senior citizen (n=88)	33	12	25	16	30
Well-child care, birth to 12 years (n=86)	14	12	39	21	29
Prenatal care	17	27	31	12	17
Contraceptive management	30	34	16	7	12

\* n=87 students taking the family medicine preceptorship as their final rotation in academic years 1990–1996, except as noted

FMP—family medicine preceptorship

Not done—number of students who did not actively practice the skill during their entire third year

Prior only—number of students who actively practiced the skill only on prior rotations and not on FMP

Both—number of students who actively practiced the skill both during a prior rotation and during the FMP

FMP only—number of students who actively practiced the skill only during the FMP and not during any prior rotation

% FMP only—percent of students who performed the skill uniquely on FMP. Calculated from  $100 \times (\text{FMP only}) / (\text{Prior only} + \text{both} + \text{FMP only})$

Items in bold above the heavy line offered unique learning, ie, at least half of the students who performed the skill any time during the year performed it during the FMP.

Shaded area—items identified as offering substantial learning and reinforcement provided strong reinforcement of learning from earlier clerkships, as well as new learning for many students.

Items with approximately 75 responses were dropped from the instrument in 1995.

skills, the preceptorship provided the majority of students with the practice opportunities that were provided during the third year of medical school.

**Substantial Learning and Reinforcement.** For three additional prevention practices, the preceptorship provided active learning experiences for more than half of the students who actually performed these skills at any time during the third year. These skills included smoking cessation, obtaining a history of activities of daily living from a senior citizen, and well-child care.

#### Clinical Problems

Data on management of clinical problems is shown in Table 2.

**Unique Learning.** At least 50% of third-year students received active experience with six problems—acute strains and sprains, low-back pain, sinusitis, strep throat, acute bronchitis, and osteoarthritis—only during their family medicine preceptorship. For all six of these clinical problems, the preceptorship provided the majority of students with the practice opportunities that were provided during the third year.

**Substantial Learning and Reinforcement.** For nine additional clinical problems, the family medicine preceptorship provided experience for more than half of the students who actively practiced the skills. These skills included diarrhea in an adult, vomiting or diarrhea in a child, new onset abdominal pain, acute otitis media, upper respiratory tract infection, skin rashes, headache, asthma, and hypertension.

#### Procedural Skills

As shown in Table 3, the family medicine preceptorship provided few opportunities to perform procedures.

**Unique Learning.** The family medicine preceptorship provided unique experience for 50% or more of students in six procedures—removal of ocular foreign body, hemorrhoid thrombosis, circumcision, reduction of dislocated joint, removal of ingrown toenail, and joint aspiration or injection. However, most of these procedures were done by a small number of students.

Table 2

## Clinical Problems Where the Family Medicine Preceptorship Provided Unique or Significant Learning Contributions\*

Clinical Problems	Not Done	Prior Only	Both	FMP Only	% FMP Only
<b>Acute strain/sprain (not low back)</b>	<b>25</b>	<b>1</b>	<b>17</b>	<b>44</b>	<b>71</b>
<b>Low-back pain</b>	<b>23</b>	<b>2</b>	<b>21</b>	<b>41</b>	<b>64</b>
<b>Sinusitis</b>	<b>13</b>	<b>5</b>	<b>25</b>	<b>44</b>	<b>59</b>
<b>Strep throat</b>	<b>15</b>	<b>5</b>	<b>28</b>	<b>39</b>	<b>54</b>
<b>Acute bronchitis (n=86)</b>	<b>27</b>	<b>5</b>	<b>22</b>	<b>32</b>	<b>54</b>
<b>Osteoarthritis (n=86)</b>	<b>22</b>	<b>3</b>	<b>27</b>	<b>34</b>	<b>53</b>
Diarrhea in an adult (n=85)	33	13	14	25	48
Vomiting or diarrhea in a child (n=86)	31	13	16	26	47
New onset abdominal pain (n=86)	8	14	29	35	45
Acute otitis media	10	6	38	33	43
Upper respiratory tract infection (n=86)	10	6	37	33	43
Eczema or dermatitis (skin rash)	19	10	30	28	41
Headache (n=85)	28	9	25	23	40
New-onset chest pain (n=86)	29	24	12	21	37
Symptoms of menopause (n=85)	41	17	12	15	34
Anxiety (n=84)	31	24	12	17	32
Breast cancer (n=76)	54	10	5	7	32
Asthma (not COPD)	29	11	29	18	31
Hypertension (n=86)	9	9	48	20	26
Vaginitis (n=85)	37	19	17	12	25
Boil, carbuncle, cellulitis (n=86)	31	21	20	14	25
Irregular menstrual periods	43	20	13	11	25
Urinary tract infection	10	26	34	17	22
Chronic ischemic heart disease (n=86)	25	22	26	13	21
Depression	18	30	26	13	19
Congestive heart failure (n=86)	14	23	37	12	17
Diabetes mellitus (n=85)	12	25	37	11	15
Anemia	26	34	18	9	15
COPD (n=86)	23	25	32	6	10
Colon cancer (n=76)	41	24	8	3	9
Alcohol abuse (n=84)	41	28	12	3	7

\* n=87 students taking the family medicine preceptorship as their final rotation in academic years 1990–1996

COPD—chronic obstructive pulmonary disease

FMP—family medicine preceptorship

Not done—number of students who did not actively practice the skill during their entire third year

Prior only—number of students who actively practiced the skill only on prior rotations and not on FMP

Both—number of students who actively practiced the skill both during a prior rotation and during the FMP

FMP only—number of students who actively practiced the skill only during the FMP and not during any prior rotation

% FMP only—percent of students who performed the skill uniquely on FMP. Calculated from  $100 \times (\text{FMP only}) / (\text{Prior only} + \text{both} + \text{FMP only})$

Items in bold above the heavy line offered unique learning, ie, at least half of the students who performed the skill any time during the year performed it during the FMP.

Shaded area—items identified as substantial learning and reinforcement provided strong reinforcement of learning from earlier clerkships, as well as new learning for many students.

**Substantial Learning and Reinforcement.** For three additional procedural skills, the family medicine preceptorship provided active learning experiences for more than half of the students who actively practiced these skills at any time during their third year. These skills were tympanometry, visual exam for a senior citizen, and removal of impacted cerumen or foreign body from the ear.

### Students' Responses to Open-Ended Question

The 1995 cohort of students who were asked, "What unique learning experiences did you have on your preceptorship as compared to all other rotations to date during your third year?" provided several responses. Students commented on their exposure to preventive medicine, the chance to "feel like a physician," the variety of disease processes encountered, the opportunity for continuity of care, the ability to work one-on-one with a physician, and observation of the preceptor's lifestyle. Table 4 shows sample responses.

### Discussion

Even though these medical students had completed a series of traditional third-year rotations, there were several important ambulatory medical skills for which the majority of students received their active practice experience only during a short family medicine preceptorship that came at the end of the year. These skills represented the application of preventive health care to patients older than age 12 and diagnosis and management of common problems—respiratory tract infections, strains and sprains, back pain, and joint problems. The

preceptorship also provided substantial active learning experiences for students who performed other preventive skills (well-child care, patient education, and counseling for smoking cessation) and who diagnosed and managed common clinical problems (diarrhea, skin rashes, otitis media, headache, asthma, abdominal pain, and hypertension.) Although the preceptorship did not provide unique learning oppor-

Table 3  
Procedures Where the Family Medicine Preceptorship Provided Unique  
or Significant Learning Contributions\*

<i>Procedures</i>	<i>Not Done</i>	<i>Prior Only</i>	<i>Both</i>	<i>FMP Only</i>	<i>% FMP Only</i>
<b>Removal of foreign body from eye (n=86)</b>	<b>74</b>	<b>2</b>	<b>0</b>	<b>10</b>	<b>83</b>
<b>External hemorrhoid thrombosis I&amp;D (n=85)</b>	<b>78</b>	<b>2</b>	<b>0</b>	<b>5</b>	<b>71</b>
<b>Infant circumcision (n=85)</b>	<b>72</b>	<b>4</b>	<b>0</b>	<b>9</b>	<b>69</b>
<b>Reduction of dislocated joint (n=75)</b>	<b>71</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>50</b>
<b>Removal of ingrown toenail (n=86)</b>	<b>78</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>50</b>
<b>Joint aspiration or injection (n=86)</b>	<b>64</b>	<b>8</b>	<b>3</b>	<b>11</b>	<b>50</b>
Tympanometry (n=84)	63	7	4	10	48
Clinical exam for visual impairment in a senior citizen (n=86)	67	7	3	9	47
Flexible sigmoidoscopy (n=85)	71	8	1	5	36
Clinical exam for hearing impairment in a senior citizen (n=64)	50	6	3	5	36
Diaphragm fitting (n=86)	80	3	1	2	33
Cast application (n=86)	63	14	2	7	30
Prescription of orthopedic device (cervical collar, crutches, cane (n=86))	63	12	4	7	30
<b>Removal of impacted cerumen or foreign body from ear (n=86)</b>	<b>28</b>	<b>15</b>	<b>27</b>	<b>16</b>	<b>28</b>
Drainage of subungual hematoma (n=86)	78	5	1	2	25
Repair of episiotomy or vaginal laceration (n=86)	53	20	5	8	24
I&D of abscess (n=85)	51	24	3	7	21
Endometrial biopsy or aspiration (n=86)	72	10	1	3	21
Nursing home placement of a patient (n=83)	58	18	2	5	20
Spirometry (FEV <sub>1</sub> and FVC) (n=85)	51	27	1	6	18
Suture of laceration (n=86)	16	24	34	12	17
Aspiration of breast cyst (n=84)	78	5	0	1	17
Excisional biopsy of skin (n=86)	31	35	11	9	16
IM/SUB-Q injection (n=75)	17	28	22	8	14
Colposcopy (n=86)	72	11	1	2	14
Throat culture: obtain specimen (n=75)	18	21	30	6	11
EKG: attach leads and obtain tracing (n=85)	46	27	8	4	10
Punch biopsy of skin (n=85)	29	46	6	4	7
Vaginal delivery (n=86)	30	39	14	3	5
Cryotherapy of skin lesions (including warts) (n=86)	6	44	32	4	5
Breast examination (n=85)	1	25	55	4	5
Stool test for blood (n=85)	5	30	46	4	5
Microscopic exam of skin scraping for fungus/parasites (n=86)	12	57	14	3	4
Microscopic exam of vaginal smear (n=86)	13	53	17	3	4
Laryngoscopy (n=84)	31	42	9	2	4
Microscopic exam of urine (n=86)	9	43	32	2	3
Pelvic exam and Pap smear (n=85)	2	26	55	2	2
Urinary catheterization (n=75)	9	59	6	1	2
Examination of prostate for enlargement or mass (n=86)	4	37	43	2	2

\* n=87 students taking the family medicine preceptorship as their final rotation in academic years 1990–1996

I&D—incision and drainage

FMP—family medicine preceptorship

Not done—number of students who did not actively practice the skill during their entire third year

Prior only—number of students who actively practiced the skill only on prior rotations and not on FMP

Both—number of students who actively practiced the skill both during a prior rotation and during the FMP

FMP only—number of students who actively practiced the skill only during the FMP and not during any prior rotation

% FMP only—percent of students who performed the skill uniquely on FMP. Calculated from  $100 \times (\text{FMP only}) / (\text{Prior only} + \text{both} + \text{FMP only})$

Items in bold above the heavy line offered unique learning, ie, at least half of the students who performed the skill any time during the year performed it during the FMP.

Shaded areas—items identified as substantial learning and reinforcement provided strong reinforcement of learning from earlier clerkships, as well as new learning for many students.

Table 4

**Student Responses to the Question “Think About Your Family Medicine Preceptorship in Relation to All of Your Other Third-year Clerkships to Date. What Unique Learning Experiences Did You Have on Your Preceptorship as Compared With All Other Rotations to Date During Your Third Year?”**

*Responses*

- The most unique aspect of family medicine rotation was the exposure to a lot of preventive medicine (eg, people who aren't apparently ill but may be at risk for hypertension, diabetes mellitus, high cholesterol, or depression). Also the number of patients I was able to see and the variety of medical problems they presented with. Also, working one-on-one with a preceptor, I was able to pick up a lot of office management information.
- The family medicine rotation is unique in a certain inherent independence. It is one of the first opportunities to feel like a physician. It also gives us a look at the “real world.”
- One distinction is the great variety in disease processes encountered. Another is the closeness the family physician maintains with his/her patients (knows each family member and event in their lives). I was able to see medicine performed in the “real world” (outside a tertiary care setting). I had a rude awakening to the world of insurance . . . HMOs, managed care, constantly being hassled by insurance companies.
- Treating common illnesses I had not seen before, such as gout, acute presentation of myocardial infarction, cardiovascular accident, angina, and a broken ankle. Interaction with drug reps.
- Opportunity to see returning patients, eg, patients who returned 1–2 weeks after initial visit for follow-up of a specific problem.
- Actually delivered a baby; didn't get to on OB-GYN rotation. Saw several dermatologic diseases I hadn't seen before. Saw how DOs treat musculoskeletal complaints.
- I dictated nearly every patient after the first 2 days of training. I was almost always first in the room and got to make clinical decisions routinely. Excellent rotation.
- Outpatient care with continuity. Management of common diseases. Exposed to management of a medical practice. Close relationship with preceptor and staff.
- I had the chance to be a lot more autonomous. I could actually give my opinion on a patient's health care and act on it. This, along with the variety of the cases I saw, helped me decide on my career choice: family practice.
- Ability to be in an office-based ambulatory setting. To take care of common complaints. To experience everyday and family life as a physician would. To be appreciated.
- As compared to my other M3 clerkships to date, my family medicine preceptorship provided me with an understanding and working knowledge of how physicians in private practice manage patient responsibility, as well as colleague interaction when confronted with difficult cases. The rotation stressed the importance of the recognition of common illnesses that are routinely encountered during specific seasons and with difficult patient populations in the physician's practicing community.

tunities for this group of substantial learning skills, the majority of students who practiced them did so on the family medicine preceptorship or reinforced them during the family medicine preceptorship.

Our diagnoses closely approximate the constellation of problems seen by family practice students in a study at the Grand Rapids, Mich, campus of Michigan State University.<sup>8</sup> In contrast, students in internal medicine at that campus predominantly saw circulatory, cardiac, endocrine, metabolic, musculoskeletal, and gastrointestinal problems.<sup>8</sup> As noted in other studies of procedural skill learning by medical students,<sup>9,10</sup> the family medicine preceptorship provided few contributions to the learning of procedural skills.

Since this study was based on the last rotation of the academic year, students should have been at their peak level of performance as third-year students. It is possible that students were allowed to be more active learners simply because they had better-developed skills; students participating in the preceptorship at

other times of the year may not have been provided as many opportunities for active practice. Another limitation of this study is that the data are self-reported by students who are required to recall their level of prior involvement with clinical skills and their level of participation during a 2- or 3-week period. Students' self-reports could be inaccurate, and we had no objective measures (eg, a log book) with which to verify the accuracy of students' reports. One further limitation relates to the meaning of words. Students and faculty may not agree whether the student truly managed the problem under faculty supervision or performed a procedure. Similarly, the interpretation of some terms, such as “preventive health care,” may be inconsistent. Finally, it is acknowledged that no specialty is defined merely by procedures performed and clinical problems seen. The approach to patient care and process of care are not addressed by our instruments.<sup>8</sup>

Despite these limitations, an important implication of our results is that family medicine educators should focus attention on those skills and activities to which students are exposed only or mainly while on family medicine rotations. For such skills, it is important that instruction be systematic and comprehensive and that evaluations be performed to assure that students have learned the skills.

### Conclusions

In summary, this short family medicine preceptorship provided third-year medical students with unique opportunities to perform a number of clinical skills. The wide variety of skills performed indicates that there is a great potential for clinical learning in family physicians' offices.<sup>9</sup> We find no support for the supposition that a family medicine preceptorship is merely a repeat of what is experienced on the traditional major clerkships. Our conclusion is that family medicine preceptorships can provide many unique and valuable active learning experiences for third-year medical students.

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