A Comparison of Family Medicine and Internal Medicine Experiences in a Combined Clerkship

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Background: Learning experiences during the medical school clinical rotation are largely shaped by patient contacts in a variety of clinical settings. For this reason, it is important to learn as much as possible about whether learning goals are being met. The patient encounter log has been used as a program evaluation tool to track students' clinical experiences. Methods: In the present study, we used a scannable pencil and paper form to compare clinical and demographic data from two primary care experiences in a multidisciplinary clerkship. Students manually recorded the encounter date, patient age and gender, the students' level of involvement with the patient, and involvement with procedures. Up to four diagnoses relevant to the encounter were also recorded. To document the clinical content of the encounters, International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) codes were used. Results: Differences in patient encounters were found in five of the most frequently logged ICD-9-CM categories and also the presence of multiple diagnostic categories. Fewer family medicine encounters could be categorized as observational than general internal medicine encounters, and students on the family medicine month conducted physical examinations more frequently. Lower patient age was recorded for family medicine patients seen. Patient gender was balanced and comparable for the two specialties. The majority of the most frequently logged ICD-9-CM categories were strikingly similar. The range of diagnoses logged was identical. Students also documented similar opportunities for first contact with patients, doing patient histories, and the lack of exposure to procedures. Conclusions: Ambulatory family medicine and internal medicine experiences can be both reinforcing and complementary, resulting in a more complete view of primary care. Common exposures in some diagnoses, ie, hypertension, can illuminate subtle differences in how family physicians manage patients in contrast to general internists. Students benefit from "hearing it again" but also from seeing that different approaches can lead to beneficial effects for patients. Other diagnoses that students experience in family practice offices that differ from their internal medicine rotation and vice versa ensure that students experience both the breadth and depth of primary care.

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In an ever-changing health care environment, medical schools are constantly revising curricula to provide students with up-to-date information and current teaching methods. New goals and objectives often mean incorporating additional clinical sites and expanding the number of preceptors to meet new demands. This is especially true in ambulatory teaching settings.

Learning experiences during the medical school clinical rotation are largely shaped by patient contacts in a variety of clinical settings. For this reason, it is important to learn as much as possible about whether learning goals are being met.1,2

Building on a long-standing 4-week family medicine rotation, a new ambulatory care clerkship emerged as part of an overall revision of the clinical curriculum at Ohio State University. The new clerkship includes rotations in both family medicine and internal medicine. Introduction of the new curriculum provided us with an opportunity to determine how experiences might differ when students were assigned to family physicians versus general internists.

Encounter logs have long been used as a method of tracking students' clinical experiences as part of program evaluation. Logging strategies have included log books, electronic medical records, and data based on the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) as the means for capturing the clinical content of patient encounters.3,9

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In the present study, we used ICD-9-CM for labeling clinical content on a scannable pencil and paper form. This was done to standardize how students labeled the patient encounters and to make the full range of clinical diagnoses reportable. Our purpose was to apply logging methods derived from earlier studies in a comparison study of clinical and demographic data from two separate experiences (internal medicine and family medicine) contained in an ambulatory clerkship. Our working hypothesis was that data derived from the patient encounter logging procedures would not differ significantly between students’ rotations in the two primary care disciplines.

Methods
Data were collected during the 1999–2000 academic year from third-year medical students assigned to a required ambulatory clerkship from July to December 1999. Three 4-week rotations make up the clerkship: family medicine, general internal medicine, and a specialty elective. Students were required to document 60 patient encounters, 30 from the family medicine 4-week rotation and 30 from the general internal medicine 4-week rotation. Log data from the specialty elective were not collected. To ensure a representative sample of patient encounters, instructions specifically requested that students log an average of seven to eight patient encounters per week and that they avoid recording all seven to eight encounters from patients seen on the same day. Analysis of the encounter dates suggested that students generally complied with these instructions.

Clerkship Sites
Preceptor sites for both family medicine and internal medicine were a blend of urban, suburban, small city, and rural private practices, with limited use of community-based residency clinics. Profile data for the family practices revealed that the majority were comprised of groups of two or more physicians located in small cities, suburbs, and a large metropolitan area. Rural practices, in towns of populations under 2,500, comprised only 11% of the family medicine sites. Family physicians’ patients were the full range of age groups from newborns to older adults, with the majority occupying the young to older adult age ranges. The internists also practiced in groups in most of the same cities with the exception of slightly fewer in rural locations. The preponderance of patients seen by the internal medicine preceptors were in the middle-age to older adult age groups. Payer mix data for the teaching sites was not collected.

Students expressed their preferences for specific practice sites, and the clerkship coordinator assigned them to those sites when possible. The process of assigning students to clerkship sequences in the third year was done randomly and, for this reason, the sample group was considered representative of the class as a whole. Student ID numbers were used to ensure that each student met the required number of patient encounters. Once it was determined that students had met the requirements, the data were aggregated, and students’ identities were anonymous.

Logging Encounters
Logging was done on paper and pencil forms scanned using TELEform® Software, a software program that facilitates automated data collection using paper, electronic, and Internet or Intranet forms (version 6.0, November 1998, Cardiff Software, Inc, Vista, Calif, 800-659-8755). Students manually recorded the encounter date, patient age and gender, students’ level of involvement with the patient (observed only/saw patient before preceptor/did history/did physical), and involvement with procedures (assisted with/performedit). Up to four diagnoses relevant to the encounter were also recorded.

To document the clinical content of the encounters, ICD-9-CM codes were used. Our use of ICD-9-CM was limited to the first three digits of each “category” as a logical way to group data and reduce the codes to a manageable number. An example of a category studied is “Hypertensive Disease 401–405.”

Data Analysis
Analyses of log data using SPSS-PC for Windows 10.0® were performed to compare and contrast students’ experiences in family medicine and internal medicine. Case mix, levels of student involvement, presence of multiple codes, average age of patients, and exposures to office procedures were considered. Paired ranking lists, representing the top 10 most frequently logged diagnostic categories, were analyzed using Spearman rank correlation. Differences were defined as greater than five rank positions. Descriptive statistics, chi-square tests, and independent t tests were performed on the case mix and demographic data. To validate that our students were seeing patients representative of most ambulatory practices, our case mix, gender, and age data were compared to National Center for Health Statistics (NCHS) data (US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Center for Health Statistics, unpublished data, 1999).

Results
Usable data were collected from 87 of the 105 third-year students who completed the clerkship during the time of the study. Logs from the remaining 18 students could not be analyzed as a result of errors in assigning diagnostic codes or incomplete log forms.
Diagnoses

When compared to national data, our data closely mirrored that of the NCHS top 10 “most frequent principal diagnoses.” Of our family medicine and internal medicine ranked categories, 8 of 10 and 6 of 10, respectively, were also ranked among the top 10 in the NCHS data. One notable difference is our top-ranked category, “Symptoms.” The fact that this ranked high in our data and not in the NCHS data may reflect a tendency of practices to code and therefore students to log chief complaints rather than referrals to log chief complaints rather final diagnoses for some patient encounters.

Table 1 displays the side-by-side rankings of the most frequent ICD-9-CM categories for family medicine and internal medicine. Overall, the paired rankings were not well correlated (Spearman rho=.48, P>.05). Differences of more than five rank positions were shown for five of the diagnostic categories depicted. The range of diagnostic categories was perfectly matched, with 102 different individual codes logged for both family medicine and internal medicine. The remaining paired ranks were similar, as shown. There were, however, significantly more logs on which students recorded two or more diagnosis categories on the internal medicine month than on the family medicine month (internal medicine=2.0, family medicine=1.7, t=10.11, df=5206, P<.001).

Student Involvement

There were differences in the levels of direct involvement in patient care between the family medicine and internal medicine months. Encounters in which students “observed only” were less frequent in family medicine than in internal medicine encounters (family medicine 15%, internal medicine 19%, chi square=11.06, P<.001). Students conducted physical exams more often in family medicine than in internal medicine (77% versus 73%, chi square=16.61, P<.001).

The results were similar on two other involvement variables. For the family medicine and internal medicine months, 74% and 73%, respectively, of the encounters involved students having first contacts with patients (chi square=1.41, P>.05). The frequency of encounters in which students indicated that they did the patient history themselves was also similar (family medicine 77%, internal medicine 73%, chi square=2.62, P>.05).

Although the number of procedures to which students were exposed was so few that the differences found probably were not meaningful, the probability of a student getting the opportunity to “perform” a clinical procedure was greater in family medicine than in internal medicine (family medicine 3.4%, internal medicine 1.7%, chi square=14.79, P<.001). The opportunity to “assist with” a clinical procedure did not mark-

Table 1

Top ICD-9-CM Categories Logged for the 4-week Family Medicine and General Internal Medicine Rotations

<table>
<thead>
<tr>
<th>FM Rank</th>
<th>#</th>
<th>IM Rank</th>
<th>#</th>
<th>ICD-9-CM Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>206</td>
<td>1</td>
<td>302</td>
<td>780–89 Symptoms</td>
</tr>
<tr>
<td>2</td>
<td>193</td>
<td>4</td>
<td>131</td>
<td>460–66 Acute Respiratory</td>
</tr>
<tr>
<td>3</td>
<td>179</td>
<td>2</td>
<td>254</td>
<td>401–05 Hypertensive Disease</td>
</tr>
<tr>
<td>4</td>
<td>143</td>
<td>14</td>
<td>55</td>
<td>V70–82 Persons Without Reported Diagnosis Encountered During Exam</td>
</tr>
<tr>
<td>5</td>
<td>128</td>
<td>3</td>
<td>170</td>
<td>250–59 Diseases of Other Endocrine Glands</td>
</tr>
<tr>
<td>6.5*</td>
<td>94</td>
<td>9</td>
<td>81</td>
<td>300–16 Neurotic Disorders, Personality Disorders, and Other Nonpsychotic Mental Disorders</td>
</tr>
<tr>
<td>6.5*</td>
<td>94</td>
<td>43</td>
<td>3</td>
<td>V20–29 Persons Encountering Health Services Related to Reproduction and Development</td>
</tr>
<tr>
<td>8</td>
<td>79</td>
<td>5</td>
<td>103</td>
<td>490–96 COPD and Allied Conditions</td>
</tr>
<tr>
<td>9</td>
<td>78</td>
<td>7</td>
<td>89</td>
<td>710–19 Arthropathies and Related Disorders</td>
</tr>
<tr>
<td>10</td>
<td>77</td>
<td>11</td>
<td>65</td>
<td>722–24 Dorsoapathies</td>
</tr>
<tr>
<td>11</td>
<td>75</td>
<td>15</td>
<td>47</td>
<td>380–89 Diseases of the Ear and Mastoid Process</td>
</tr>
<tr>
<td>12</td>
<td>73</td>
<td>6</td>
<td>98</td>
<td>420–29 Other Forms of Heart Disease</td>
</tr>
<tr>
<td>18</td>
<td>49</td>
<td>10</td>
<td>71</td>
<td>725–29 Rheumatism Excluding the Back</td>
</tr>
<tr>
<td>20</td>
<td>39</td>
<td>8</td>
<td>82</td>
<td>530–37 Diseases of the Esophagus, Stomach, and Duodenum</td>
</tr>
</tbody>
</table>

Total FM encounters: 2,591, most frequent FM encounters: 1,580 (61% of total)
Total IM encounters: 2,527, most frequent IM encounters: 1,649 (65% of total)

ICD–9–CM—International Classification of Diseases, 9th Revision, Clinical Modification
COPD—chronic obstructive pulmonary disease

* The tie in these ranks was managed by using the average of the next two ranks (6+7/2), and advancing by one rank all the succeeding categories.
Family medicine and internal medicine differ between family medicine and internal medicine encounters (family medicine 2.3%, internal medicine 1.6%, chi square=3.10, P>.05).

Patient Demographics

The patient demographic variables studied were age and gender. There was a significantly lower average age of patients seen in family medicine than in internal medicine practices (family medicine mean=43, internal medicine mean=53, t=15.14, df=5133, P<.001). Using NCHS age groupings, patient age distributions are compared among our data and the NCHS age data shown in Figure 1. Not surprisingly, in both age distribution and in comparison to national data, family medicine served a wider spectrum of patients than internal medicine.

Differences between family medicine and internal medicine in patient gender were also documented; however, those differences were not statistically significant (family medicine 58% female, 42% male; internal medicine 56% female, 44% male; chi square=3.257; P>.05). Figure 2 contrasts our gender data with the NCHS gender data. The NCHS data reflects a greater proportion of female patients than that reflected in our family medicine and internal medicine data.

Discussion

We noted significant differences in patient encounters documented by students in the family medicine and internal medicine months. Ranks for five diagnostic categories in particular were found to differ widely. The most profound differences in the code groupings were for the two preventive codes, V70–82 and V20–29. Included in these categories and likely accounting for much of the differences in their frequencies are the general medical, gynecologic, and well-child exams that are more likely to be performed by family physicians than by internal medicine physicians.

Other differences we noted were that students logged more multiple diagnostic categories on the internal medicine month. Further, fewer family medicine than internal medicine encounters were observational, and students on the family medicine month conducted physical examinations more frequently. Lower patient age was recorded for family medicine patients seen.

Similarities were seen in five of the top 10 diagnostic categories. The range of diagnoses, or the number of different categories logged, was identical. Students also documented similar opportunities for first contact with patients and for doing patient histories. Finally, the lack of exposure to procedures and patient gender mix were found to be comparable. With the exception of the gender percentages, our data closely matched that of the NCHS for primary care visits, thereby indicating that our students saw patients representative of ambulatory care practices on a national basis and also indicating that the student logs were probably valid.

Efforts were made to ensure that the encounters logged by the students were a true reflection of their experiences over the course of each of the primary care months. Nevertheless, because not all encounters were logged, the data is potentially subject to reporting biases. Bias may have also been introduced by only including data logged by half of the third-year class in the study. Using ICD-9 CM categories narrowed the scope to the elements in patient encounters resulting in reimbursement. Family systems and preventive aspects if accounted for may have resulted in greater contrast between family medicine and internal medicine.
Despite the limitations, the study suggests that community-based clinical rotations in family medicine and internal medicine, when viewed side by side in the context of a single clerkship, are comparable in terms of case mix, patient gender, direct student involvement, and lack of exposure to office procedures. The results were generally consistent with our working hypothesis.

**Implications**

What are the implications of our data to family medicine departments and medical school curriculum committees? First, ambulatory family medicine and internal medicine experiences can be both reinforcing and complementary, resulting in a more complete view of primary care. Common exposures in some diagnoses, i.e., hypertension, can illuminate subtle differences in how family physicians manage patients in contrast to general internists. Students benefit from “hearing it again” but also in seeing that different approaches can lead to beneficial effects for patients. Other diagnoses students experience in family medicine offices that differ from their internal medicine rotation and vice versa ensure that students experience both the breadth and depth of primary care.

Second, minimal exposure to common ambulatory procedures in both specialties, while disconcerting, is not surprising. Economic factors and the costs and risks associated with malpractice may have reduced the numbers of family physicians and internists performing procedures in the office.

Finally, the case mixes, and thus the experiences for the students, in family medicine and general internal medicine might be found in other geographic locations. To determine if any regional differences exist, a study similar to ours should be conducted in other parts of the country.

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