



# Clinical Resources to Teach Components of a New Family Medicine Clerkship Curriculum

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**BACKGROUND AND OBJECTIVES:** This retrospective study was designed to determine the capacity of a 6-week distributed Family Medicine Clerkship to provide student documented patient encounters that could facilitate instructions on the acute illness and chronic disease components of the new Family Medicine Clerkship Curriculum (FMCC). The FMCC was developed to standardize core clinical education experiences in Family Medicine Clerkships in US medical schools.

**METHODS:** Three years (FY06–FY08) of patient encounters documented by students and compiled in a Family Medicine Clerkship patient encounter database at the Medical College of Georgia were examined to determine the presence of patient experiences consistent with the acute illness and chronic disease presentations objectives of the new FMCC. The study cohort consisted of 537 students encountering 78,770 patients in 21 learning sites.

**RESULTS:** Fifty-five percent of the FMCC acute illness presentations objectives (n=20) were encountered at least once by >90% of the students while 81% of the chronic disease presentations objectives (n=16) were encountered at least once by >90% of the students. All students encountered patients with multiple chronic diseases, with an average of 32.29 and 13.6 student patient encounters containing two and three chronic diseases respectively. Patient volumes for the FMCC acute illness and chronic disease objectives ranged from means of 0.37 to 10.37 and 2.24 to 57.47 per student respectively.

**CONCLUSIONS:** The study suggests that a 6-week Family Medicine Clerkship could provide patient experiences to facilitate student instructions on most of the acute illness and chronic disease presentations objectives of the new FMCC.

(Fam Med 2011;43(8):566-73.)

The capacity of diverse and distributed clinical settings to provide medical students adequate patient encounters to support required family medicine and/or primary care clerkship course objectives continues to be a major challenge for

curricular planners and managers. The recent emergence of the Family Medicine Clerkship Curriculum (FMCC)<sup>1-4</sup> potentially creates additional demands on clinical learning sites networks to provide consistent patient encounters that facilitate

achievement of clerkship goals that include core elements of an emerging national norm. The FMCC was developed by a Society of Teachers of Family Medicine (STFM) special task force consisting of representatives of national academic family medicine organizations and was endorsed by the Council of Academic Family Medicine. The task force was charged “to define the core objectives and content of a Family Medicine Clerkship” to facilitate educational consistency of these required clinical learning experiences in all US medical schools. The curriculum was based on a visit-purpose structure divided into acute illness, chronic disease, and health maintenance/prevention presentations in the context of comprehensive and continuous care of patients and families.<sup>1-4</sup>

Developing and maintaining educational consistency across distributed family medicine and other primary care clerkship learning sites is complicated by the diversity, size, number, and organizational structure of clinical venues and the varying instructional skills of academic and community faculty. Although primary care ambulatory patient populations in these settings are large and clinically diverse, non-directed and random assignment of students’ patient encounters may not achieve

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the consistent experience over time and across multiple learning sites to support individual clerkship curricular objectives. To address this issue, many family medicine and primary care clerkships successfully use problem and diagnostic clinical encounter objectives to facilitate appropriate patient selection for medical student learning in response to school-specific course learning objectives. A similar approach could be used to ensure student access to any additional patient encounters required to support the clinical visit presentations objectives of the new FMCC.

The adequacy of clinical experiences needed to facilitate clerkship course objectives can be assessed by review of students' patient encounter experiences using periodic or continuous documentation tools.<sup>5-9</sup> These reviews may reveal the need for strategic prospective patient assignments, faculty development, and supplemental instructional resources (eg, clinical case problems, OSCE, etc) to address persistent clinical experience inconsistency or inadequacy. Students' clinical experience documentation records permit retrospective, real time, and/or prospective assessment of patient encounters used to support the clerkship's curricular objectives. This study was designed to determine the capacity of a 6-week distributed Family Medicine Clerkship to provide student documented patient encounters that could facilitate instructions on the core acute illness and chronic disease components of the newly developed FMCC.

## Methods

A retrospective assessment of the FMCC core acute illness and chronic disease presentations occurrences in Family Medicine Clerkship students' patient encounter documentations was conducted to determine the consistency and quantity of student access to patient resources providing these experiences. This study was conducted with IRB approval. The study examined students' Family Medicine Clerkship patient care

documentations compiled for the consecutive academic years of FY06, FY07, and FY08. The documentation data were collected in a 6-week geographically decentralized third-year Family Medicine Clerkship at the Medical College of Georgia. Over the study period, the School of Medicine had an average third-year class of 179 students distributed over 22 learning sites. These sites consisted of seven family medicine residencies, 14 group family medicine practices, and one community health center. Students were assigned to each site at least 87.7% of the academic year, with most having students present for each of the eight clerkship rotations per year. An average of 57.5 physicians served as core instructors in the clerkship teaching network. Fifty-two percent of students were assigned to residency learning sites, and 48% of students were assigned to private practice learning sites. All learning sites received modest instructional management compensation (except one military residency program), and the Medical College of Georgia sponsored attendance to and participation in a required 3-day annual Family Medicine Clerkship Faculty Development Conference (15 hours). Periodic learning site visits were conducted each year by the clerkship director and administrative support. Students participated in all aspects of clinical care, including ambulatory, hospital, and on-call clinical services.

Students documented patient encounters in a paper logbook, which served as a portable record for review and presentation for de-identified patient demographics, presenting problems, acute and chronic diagnoses, tests, therapeutics, and procedures. Student selection and faculty assignment of patient encounters were facilitated by a list consisting of 20 presenting problems and 30 diagnostic objectives listed in the front cover of the logbook. These objectives, which differed in scope and, in many instances, content from the new FMCC guidelines, were a revision from the

original clerkship objectives created in 1983. Students were required to document a minimum of 120 patient encounters per rotation. The student logbook was reviewed and endorsed weekly by the learning site faculty. The completed faculty endorsed logbooks also served as the admission ticket to an end-of-clerkship required objective examination. The student logbook patient encounter data was entered and stored in an International Classification of Primary Care (ICPC)-based Foxpro database management system (ICPC-1-v.0.0 with modifications).<sup>10</sup> The global classification system permitted entry of all documented problems and diagnoses into the database whether or not the encounters represented clinical experience objectives of the clerkship. Data entry was facilitated by banks of problem and diagnostic synonyms and report generation by code-clustering of related problem and diagnostic entities. Data from all reviewed and endorsed logbooks from students successfully completing the clinical portion of the clerkship were included in the study. Logbook data were not included if the student either failed or did not complete the clinical component of the clerkship. The FY06–FY08 data for the study was obtained from the MCG Family Medicine (MCGFM) Clerkship patient encounter database, which contains reports from 2,958 students who encountered 385,552 patients over 18 years.

## Results

### *MCGFM Clerkship Student Clinical Experience Demographics*

Clinical experience logbook data was obtained from an average of 179 students per year or 537 students over three consecutive academic years (FY06–FY08) of the study. During those 3 years, students encountered 24,032 patients per year or a total of 78,770 patients for the study period, with patient encounters averaging 147 per student. The students documented an average of 2.5 presenting problems and 2.7 acute and chronic

diagnoses per patient. The patient population was derived mostly from ambulatory clinical venues (94.6%), with only a small number of encounters (5.4%) from inpatient venues. Only 0.6% of documented encounters was a return patient visit for the same student in the 6-week MCGFM Clerkship, most often as a hospital discharge follow-up. The documented patient encounters were distributed across the entire age spectrum with 12.8% 0–19 years of age, 63.8% 19–64 years of age, and 23.4% greater than 65 years of age. Sixty-two percent of the students' patient encounters were female and 38% male. The ethnicity of the patient population overall mirrored the ethnic distribution of the communities where the learning sites were located with an aggregate of 58.2% white, 38.2% African American, and 3.6% other ethnicities.

*Students' Patient Care Experiences Compared to the Core Acute Illness and Chronic Disease Presentations of the FMCC*

The MCGFM Clerkship curriculum contained 15 of the 20 core acute illness presentations objectives of the FMCC (see Figure 1). Two of the FMCC core acute illness presentations objectives were listed in the MCGFM Clerkship as acute or chronic diagnostic objectives while the remaining FMCC core acute illnesses, although not objectives of the clerkship, were encountered by students and documented in logbooks. The MCGFM Clerkship contained 20 acute presentations objectives that consisted of seven additional objectives not covered by the FMCC (fatigue, diarrhea, vomiting, constipation, syncope, hematuria, and amenorrhea). The FMCC core acute illness presentation objective, upper respiratory track symptoms, was analyzed in the study using documented cases of sore throat as a surrogate acute illness presentation, which was an objective in the MCGFM Clerkship. Though neither common skin lesions nor common skin rashes

were acute presentations curriculum objectives for the MCGFM Clerkship, the clerkships' diagnosis objective of common dermatoses uniquely incorporated both acute illness presentations in its overarching database code. The student patient encounter database also contained non-objective facilitated documentation of the three FMCC core acute illness presentations: cough, dementia, and male urinary symptoms.

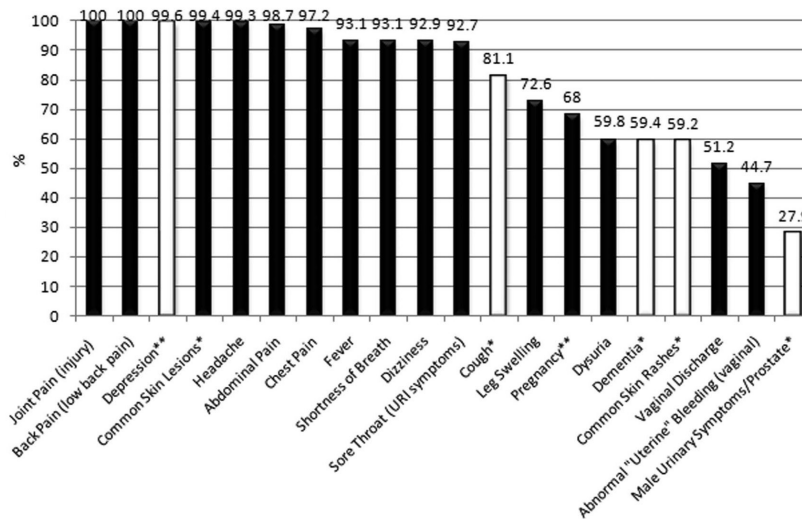
The study cohort of 537 students encountered, at least once, a mean of 15.29 (SD=±1.8) of the 20 FMCC core acute illness presentations objectives, with 78.4% of students encountering 15 or greater of these objectives. All of the 15 overlapping FMCC and MCGFM Clerkship acute illness presentations objectives were documented at least once by greater than 40% of the students. Of those, two objectives were documented at least once by 100% of students (joint pain and back pain) and 10

objectives at least once by greater than 90% of the students. The non-objective-based acute illness presentations were encountered and documented in the MCGFM Clerkship by greater than 59% of students with the exception of the male urinary symptoms, which was documented by 27% of students (see Figure 1).

*Acute*

The mean FMCC core acute presentations objectives encountered per clerkship student ranged from 0.35 (male urinary symptoms) to 10.1 (joint pain), with most (n=10) greater than 3.6 per student (see Table 1). Although many FMCC core acute illness presentations encountered were documented frequently by a large number of students, most presentations with the exception of two were not encountered by all students. Additionally, those acute presentations objectives encountered less than 3.59

**Figure 1: Average Percentage of Students Documenting FMCC Core Acute Presentations Objectives at Least Once by 537 Students Encountering 78,770 Patients (FY06–FY08)**



FMCC—Family Medicine Clerkship Curriculum

MCGFM—Medical College of Georgia Family Medicine

Black bars represent overlapping FMCC Core and MCGFM Clerkship acute presentations objectives.

\* FMCC Acute Disease objective only (also designated by white bar)

\*\* MCGFM Clerkship diagnostic objective instead of presenting problem objective

times per student and encountered by <70% of students (n=4) were more likely to be gender frequent or specific (ie, vaginal discharge, dysuria, abnormal uterine bleeding, male urinary symptoms). The objective, male urinary symptoms, was a compilation of MCGFM database categories of male urgency, frequency, hesitancy, and dysuria.

The MCGFM Clerkship curriculum contained 12 of the 15 core chronic disease objectives of the FMCC as part of its 30 acute and chronic diagnoses objective list (see Figure 2). The FMCC core chronic disease objective, asthma/COPD, was separated for analysis purposes because students documented and the clerkship's database coded them

separately. One FMCC core chronic disease objective, chronic back pain, was a sub-category of the MCGFM Clerkship presenting problem list objective, general back pain. The remaining FMCC core chronic disease presentations objectives not a part of the MCGFM Clerkship objectives (hyperlipidemia, osteoporosis, and coronary artery disease) were documented without course objective facilitation by at least 77.1% of students at least once. Coronary artery disease as a chronic disease presentation was a sub-category of heart disease for the MCGFM Clerkship diagnosis objectives, heart disease. This heart disease category consisted of many sub-categories, including congestive heart failure and

non-specific heart disease, which were not unique disease objectives but could be analyzed, were assessed separately. The MCGFM Clerkship acute and chronic diagnosis objectives list contained 13 additional objectives not on the FMCC core chronic disease presentations objectives list (headache, upper respiratory infection, lower respiratory infection, urinary symptoms, common skin dermatosis, peptic ulcer disease, anemia, fluid/electrolyte/AB disorders, skin infections, pregnancy, otitis media, infectious GI disease, and sprains/strains).

The study cohort of 537 students encountered a mean of 14.04 (SD=±1.06) of the 15 FMCC core chronic disease presentations

**Table 1: Average Frequency of Students Documenting Encounters of Family Medicine Curriculum Acute Presentations Objectives by 537 Students in 78,770 Patient Encounters (FY06–FY08)**

Acute Core Presentations Objectives	Mean	Median	Min	Max	SD
Depression	10.37	9	0	37	5.92
Joint pain (injury)	10.1	9	1	31	5.17
Common skin lesions	9.53	9	0	28	4.59
Back pain (low back pain)	8.85	8	1	28	4.46
Headache	8.29	7	0	39	5.1
Abdominal pain	6.40	6	0	24	3.55
Fever	5.19	4	0	37	4.72
Sore throat	4.92	4	0	34	4.43
Pregnancy	4.61	2	0	45	6.48
Chest pain	4.42	4	0	20	2.86
Shortness of breath	4.33	4	0	18	3.23
Dizziness	3.59	3	0	18	2.77
Leg swelling	1.51	1	0	8	1.41
Dysuria	1.13	1	0	7	1.3
Cough	2.49	2	0	20	2.53
Dementia	1.12	1	0	9	1.32
Vaginal discharge	1.08	1	0	8	1.47
Common skin rashes	1.03	1	0	6	1.19
Abnormal "uterine" bleeding (vaginal)	0.79	0	0	11	1.18
Male urinary symptoms/prostate	0.35	0	0	6	0.69

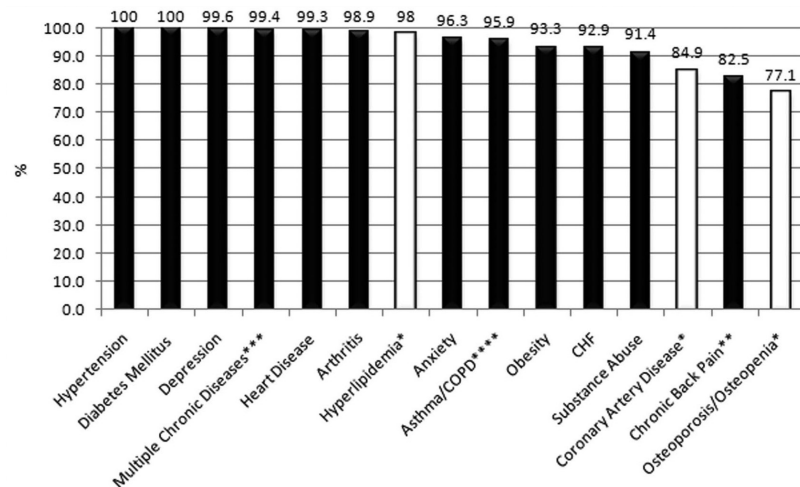
SD—standard deviation

objectives, with 64.7% of students encountering 14 or greater of these objectives. All of the 12 chronic diseases contained in both the FMCC core chronic disease list and MCGFM Clerkship's diagnosis objectives were documented at least once by greater than 80% of the students over the 3 consecutive academic years of the study. Of those objectives, two were documented at least once by 100% of students (diabetes mellitus and hypertension), and nine were documented at least once by greater than 95% of students. Five MCGFM Clerkship diagnosis objectives not contained in the FMCC core chronic disease list were documented at least once by greater than 93% of students, nine objectives by greater than 72% of students, and all 13 objectives by greater than 56% of students.

The mean FMCC core chronic disease presentations objectives encountered per clerkship student ranged from 3.61 (congestive heart failure) to 57.5 (hypertension). The high mean encounter values for hypertension, diabetes mellitus, and hyperlipidemia resulted from specific clerkship efforts to facilitate comprehensive documentation of both acute and chronic diseases in individual patients (see Table 2). The high documentation frequency of hyperlipidemia, which was not a MCGFM clerkship diagnosis objective, suggests students' documentation of patient clinical presentations were not limited by diagnosis objectives lists.

Another objective on the FMCC core chronic disease list, multiple chronic diseases in a single patient, was documented at least once by 100% of students. One-hundred percent of students documented patient encounters at least once with two, 99.4% with three, and 86.4% with four FMCC core chronic disease presentations in a single patient (see Figure 3). There were 32.29 (SD=±9.38) patient encounters per student where two FMCC chronic disease presentations occurred in a single patient, 13.6 (SD=±7.07) encounters per student with three

**Figure 2: Average Percentage of Students Documenting FMCC Chronic Disease Presentations Objectives at Least Once by 537 Students Encountering 78,770 Patients (FY06–FY08)**



FMCC—Family Medicine Clerkship Curriculum

MCGFM—Medical College of Georgia Family Medicine

Black bars represent overlapping FMCC and MCGFM chronic disease clerkship objectives.

\* FMCC Chronic Disease objective only (also designated by white bar)

\*\* MCGFM Clerkship Presenting Problem objective instead of Diagnoses objective

\*\*\* Multiple Chronic Diseases includes at least three diseases in one patient

\*\*\*\* Asthma and COPD analyzed separately revealing the same percentage of student encounters

FMCC chronic disease presentations occurring in a single patient, and 5.36 encounters per students where four FMCC chronic disease presentations occurred in a single patient (see Table 2). Additional evaluation revealed that students at residency learning sites encountered an average of 33.6 patients (n=3,897 total patient encounters) compared to an average of 31.1 patients (n=2,695 patient encounters) in community learning sites with two or more FMCC chronic disease presentations, which is a significant difference,  $t(535)=-2.89, P=.004$ . Students at residency learning sites encountered an average of 20.3 patients compared to an average of 17.7 patients in community learning sites with three or more FMCC chronic disease presentations, which is also a significant difference [ $t(535)=-2.68, P=.008$ ].

## Discussion

This retrospective study's findings showed that most third-year medical students documented encounters with patients having clinical problems contained in most of the new FMCC core acute illness and chronic disease presentations objectives in the context of a 6-week decentralized Family Medicine Clerkship over 3 consecutive academic years. This student patient experience occurred even though the MCG Family Medicine Clerkship did not contain, as patient encounter objectives, all of the FMCC core acute and chronic disease presentations objectives. The current MCGFM objectives were created based on surveys of clerkship students' encounter from 1983–1989. These surveys revealed the clinical resources that were consistently available to support student education in the learning network. The initial encounter objectives were based upon the clinical capacity of the learning network. Since these

**Table 2: Average Frequency of Students Documenting Encounters of Family Medicine Curriculum Chronic Disease Objectives by 537 Students Encountering 78,770 Patients (FY06–FY08)**

Diagnostic Objectives	Mean	Median	Min	Max	SD
Hypertension	57.47	59	13	112	17.48
Diabetes mellitus	25.79	26	4	57	9
Hyperlipidemia	19.95	17	0	92	14.46
Arthritis	11.75	11	0	46	7.1
Depression	10.37	9	0	37	5.92
Heart disease	9.52	8	0	35	6.25
Obesity	6.76	5	0	67	7.44
Anxiety	5.70	5	0	25	3.81
Chronic obstructive pulmonary disease (COPD)	5.45	5	0	19	3.72
Asthma	5.02	4	0	20	3.42
Substance abuse	4.68	4	0	31	4.22
Coronary heart disease	3.75	3	0	23	3.52
Congestive heart failure (CHF)	3.61	3	0	23	2.86
Chronic back pain	2.92	2	0	16	2.91
Osteoporosis/osteopenia	2.24	2	0	25	2.49
<b>Multiple Chronic Diseases</b>					
Two chronic diseases in a single patient	32.29	32	4	68	9.38
Three chronic diseases in a single patient	13.60	13	0	38	7.07
Four chronic diseases in a single patient	5.36	5	0	21	4.11

SD—standard deviation

original objectives were created based upon inherent clinical experiences in private practice, residency, and federally qualified health centers (FQHC) learning sites, it would suggest that clerkships in medical schools using these types of learning sites would likely experience similar student clinical encounter experiences for their students. Additionally, the MCG Clerkship did not create objectives related to multiple chronic disease experiences in the same patient; however, a retrospective review of FMCC multiple chronic disease encounters indicated that the students had, without a unique objective, encountered consistently a large number of patients with multiple chronic diseases across all learning sites. These findings would suggest, assuming the presence of

the aforementioned learning sites, that the same patient encounters would occur in the family medicine clerkships at other medical schools.

The FMCC core presentations experiences also occurred in a decentralized educational framework with diverse resident/faculty and community group practice learning sites. Student experiences at these sites were facilitated by the MCGFM Clerkship-directed presenting problems and acute and chronic diagnosis objective lists, which contained more presentations objectives than those contained in the FMCC. These experiences suggest that adequate clinical resources in diverse learning venues were available to facilitate instructions on the majority of acute and chronic disease presentations objectives contained in the

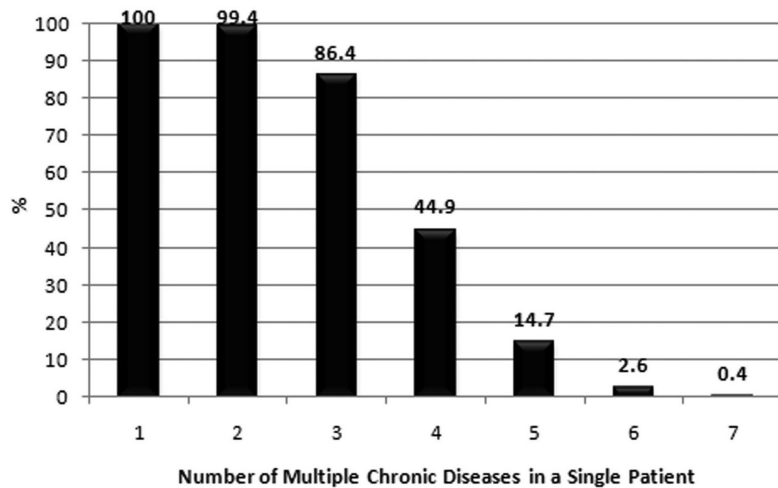
FMCC. The overall consistency of student encounters with patients having multiple chronic diseases provided opportunities to address the complexity of comprehensive care. The current study likely underestimates multiple chronic diseases in a single patient encountered by students since this analysis specifically addressed only the coexistence of the FMCC core chronic disease presentations objectives. This study revealed some of the FMCC core clinical objectives that could not consistently be supported by actual clinical encounters, which has resulted in the creation of alternative teaching resources for the clerkship curriculum, ie, problem-based learning clinical modules.

Although the students' patient populations were weighted more to

female than male (which goes along with the findings of Bertakis et al<sup>11</sup>), students still were less likely to encounter gender-specific acute presentations, such as vaginitis and abnormal vaginal bleeding and male urinary symptoms, suggesting that certain patient visits may occur less frequently in the general study population and/or be more difficult to schedule for student encounters either by patient preferences or by student and/or physician faculty selection. The frequency of student patient encounters with the FMCC core acute and chronic disease presentations objectives may have likewise been impacted by the clinical experience constraints imposed by the 6-week duration of the clerkship. The small but significant difference of the students' exposure to patients with multiple chronic disease could possibly result from truncated diagnosis listings in a faster-paced community practice setting when compared with residency learning site counterparts. The clerkship's length nor the patient encounters per students described in this study removes the possibility that similar student experiences could occur in clerkships of shorter duration albeit with smaller overall patient encounter volumes per student. The impact of frequently used learning sites when compared to clerkships with greater dispersion of students over a larger number of less frequently used learning sites is unknown.

Although students documented patient encounter experiences in logbooks, the limitation of logbook-generated patient encounter databases (no matter how simple or complex) may not have captured every patient visit's teaching and learning experience perfectly even with prescribed periodic faculty endorsement (which supports literature findings such as Patricoski et al<sup>12</sup>). Supervised patient encounter documentation as a surrogate

**Figure 3: Percentage of Students Encountering a Single Patient With Multiple Chronic Diseases\*Contained in the FMCC Core Chronic Disease Presentations at Least Once**



\* Two or more chronic diseases

for student encounters with clinical learning experiences is at best an imperfect tool. The degree of student contact with most of the core acute illness and chronic disease presentations objectives of the FMCC in this retrospective study suggests that teaching most of these clinical topics can be consistently facilitated by patient experiences in family medicine residencies, community group private practices, and community health center learning sites, which constitute the teaching network of many family medicine clerkships. Patient encounters to facilitate learning for all of the FMCC core acute and chronic presentations are unlikely to be available for all students across all sites and rotations. Prospective knowledge of patient resources, however, provided by continuous or periodic student experience documentation can assist curriculum designers in determining supplemental teaching resources required to ensure consistent attainment of not only FMCC objectives but overall objectives of individual clerkships as

well. Although the MCGFM Clerkship did not contain objectives for adult and child health maintenance, passive documentation of items under acute and chronic disease presentations and surrogate items (eg, mammography, cervical and colon cancer screening tests, comprehensive examinations, PSAs, and hemoglobin A1Cs), by greater than 50% of students suggests the presence of these experiences in the patient population encountered by students in this study and the need for further study within the similar cohorts or through other prospective analysis.

**ACKNOWLEDGMENTS:** This study was presented at the 2010 Society of Teachers of Family Medicine Predoctoral Education Conference in Jacksonville, FL. Joseph Hobbs, MD, was a member of the task force that created the new Family Medicine Clerkship Curriculum. We acknowledge Patrick Mongan, MD, who authored the students' patient encounter documentation system, and Kent Sheets, PhD, for his early support of a national Family Medicine Clerkship Curriculum.

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