Florida State University College of Medicine: From Ideas to Outcomes

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Abstract

The Florida State University College of Medicine (FSU COM) was established in 2000, the first new MD-granting medical school in the United States in over 25 years. In its brief history, the FSU COM has developed rapidly in accordance with its founding mission to meet the need for primary care physicians, especially those caring for the elderly and the underserved. The school recently received a full continuation of accreditation for the maximum period, eight years, from the Liaison Committee on Medical Education.

The authors describe FSU COM's new, innovative educational program using

community-based clinical training on six statewide regional campuses and two rural sites. Third- and fourth-year students are assigned to community physicians in a one-on-one clinical training model in all of the settings where physicians practice. Over 70% of student clinical training is in such settings. The authors describe how the model operates, including curricular oversight (which ensures quality and equivalence of the educational experience at all sites), the regional campus structure, administration, education program delivery during core

clerkships, and assessment of students' performance. Ongoing required faculty development for all clerkship faculty is an essential feature of the training program, as is tracking of all individual student contacts through an online clinical data collection system used for evaluation of the clerkship experiences as well as research.

The authors demonstrate that the school has been highly successful in implementing its mission, and that the challenge ahead is to sustain its approach to the training of future physicians.

he Florida State University College of Medicine (FSU COM) was founded in 2000 to address the need for physicians in the fourth-largest state by population in the United States. A detailed discussion

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of its founding to meet Florida's unique health care needs was described in a 2005 Academic Medicine article.¹

Medical education at FSU has its origins in the late 1960s, when the Program in Medical Sciences (PIMS) was initiated, with initial sponsorship from the National Institutes of Health, as a joint effort of FSU and the University of Florida College of Medicine (UF COM) to contribute to the supply of physicians in rural northwest Florida. Beginning in academic year 1970-1971 and continuing until 2001, 30 students selected by both institutions pursued their first year of study at FSU before transferring to the UF COM in Gainesville for their remaining three years. The PIMS emphasized selection of older and nontraditional students, who were more likely to be interested in practicing in medically underserved areas, as well as applicants from those underserved areas. The history of medical education at FSU is described in more detail in the 2005 article mentioned earlier.1 Based on these origins and a special mandate from the Florida Legislature to care for the elderly and the underserved, especially in rural areas, FSU COM was designed to become a high-quality medical school that addressed these specific needs of the state through an innovative, community-based model of medical student education. The state's goals for the new medical school were captured in the following mission statement:

The Florida State University College of Medicine will educate and develop exemplary physicians who practice patient-centered health care, discover and advance knowledge, and are responsive to community needs, especially through service to elder, rural, minority, and underserved populations.

The FSU COM enrolled its charter class of 30 students in May 2001. Over the following years, the enrollment of each entering class grew until the first class of 120 students began study in 2007. Once those students graduated in 2011, FSU COM had, for the first time, achieved its goal of annually graduating approximately 120 new physicians each year.

Moving Medical Education Out of the Medical Center

The traditional model of medical education since the time of Flexner's² famous report has been based in the academic health center. A study by White et al³ on the "ecology of medicine," reported as early as 1961 and repeated by Green et al⁴ in 2001, found that only 1 of 1,000 patients experiencing health problems

in any given month reach the academic medical centers where most medical students and residents train.* Instead, most of those seeking health care find it in ambulatory settings; interest in ambulatory training experiences for U.S. medical students has grown steadily over the past years.^{5,6}

When the development of a new medical school at FSU was being considered in the 1990s, training medical students with physicians in remote settings was in practice in very few schools within or outside the United States, including those in Australia and Canada. These served as models for basing the clerkship training of medical students with physicians in the community settings where they practiced, rather than in academic teaching hospitals.^{7,8} The use of online and remote technologies was already important for this model of medical education. This concept of training medical students with community physicians primarily outside of the hospital became the central developmental theme for Florida's new medical school. As of August 2012, the only other MD-granting medical school in the United States and Canada that has a similar, non-hospital-based, community ambulatory training model at distributed sites was the Northern Ontario School of Medicine, which admitted its first students in 2005.

The Florida State Clinical Training Model

The FSU COM developed six regional campuses over the years 2002-2007 where required clerkships in years 3 and 4 of medical school would take place. The original plan, in practice today, was for 20 students in each of years 3 and 4 (40 total) to train at each of the regional campuses. The FSU COM comprises the main campus in Tallahassee on the campus of FSU, six regional campuses (including a separate regional campus in Tallahassee), two rural sites around the state, and a site in Thomasville, Georgia, that is associated with the Tallahassee regional campus (see Figure 1). The first three regional campuses, in Orlando, Pensacola, and Tallahassee, received their first groups of third-year students in July



Figure 1 The regional campuses and rural training sites of the Florida State University College of Medicine (FSU COM). These campuses represent FSU COM's distributed, community-based clinical education model to train medical students in year 3 and year 4 after they leave the main campus (T-M). In the figure, the regional campuses are indicated by P for Pensacola, T for Tallahassee, D for Daytona Beach, O for Orlando, S for Sarasota, and F for Fort Pierce. The rural training sites are indicated by M for Marianna and I for Immokalee. There is also a rural training site in Thomasville, Georgia (Th) associated with the Tallahassee campus.

2003. In 2005, the first cohort of students reported to the Sarasota regional campus. As enrollment steadily increased, the full complement of six regional campuses was achieved in July 2007 with the opening of the Daytona Beach and Fort Pierce regional campuses.

A fundamental value for FSU COM's regional campus development was and is the importance of the local community. By design, the model did not have exclusive arrangements with any local hospital or system, and affiliation agreements with all major health care entities in each community were developed and are maintained. A community board was established at each regional campus. Each community board comprises the CEOs of the local hospital systems, representatives of other important health care entities, and medical societies and important community leaders, as well as the FSU COM regional campus dean, the senior associate dean for medical education and academic affairs, and the dean from

the central campus. This board helps vet physicians who are eligible to be appointed as regional faculty, helps recruit the regional campus dean, and advocates and develops broad-based community support for the medical school.

The regional campus deans are chosen from among physicians in the local medical community so that each dean knows that community, is known by it, and has existing strong relationships there. This helps to ensure that only respected local physicians become part of the regional campus faculty. The regional dean is the only full-time faculty member at each regional campus. The regional dean recruits the regional campus clerkship directors for each of the core year 3 (family medicine, pediatrics, internal medicine, obstetrics-gynecology, surgery, and psychiatry) and year 4 required clerkships (emergency medicine, geriatrics, advanced internal medicine, and advanced family medicine). These are practicing community physicians who are paid a stipend as part-time faculty

^{*}The study by Green et al⁴ shows how little had changed from 1961 to 2001 regarding the large percentage of patients obtaining care in the ambulatory setting. It is clear to us that this situation remains today.

members (0.3 to 0.4 FTE) to recruit clerkship faculty and oversee clerkship training for medical students at their campus. The clerkship directors work with the education directors at the main campus in each of the core disciplines to coordinate clerkship activities across all campuses.

Additional full-time staff at the campus include a campus administrator who oversees the operations of the program, a student support coordinator who serves as the student affairs liaison and helps students with scheduling of their rotations, a faculty support coordinator who manages faculty appointments and monitors faculty development programs, an information technology support person who oversees the audiovisual, video conferencing, and instructional technology components for the students and the campus, and a receptionist/secretary. All of the campus offices are at least 4,000 square feet and are located either in leased space or on local state college campuses; each has a large classroom that seats at least 40 with video conferencing linkages to all the campuses and a small conference room for group meetings. There is ample student relaxation and study space, office spaces for all of the support staff, and offices for the visiting faculty and clerkship directors. Students use this office for their "homeroom" for Wednesday didactic conferences and for study and meetings, but all of their clinical rotations take place away from the campus building in local physicians' offices and hospitals or other health care settings.

Each of the core required clerkships in year 3 and year 4 has an education director at the central campus who is responsible for developing the goals and objectives for that director's clerkship, reviewing and evaluating their clerkship regularly through the year 3 and 4 curriculum committee, and working with each of the six clerkship directors from the regional campuses in his or her discipline to ensure comparability across campuses. The education directors have regular monthly clerkship meetings via video teleconference with these clerkship directors and make regular visits to the six campuses to meet with clerkship faculty. All clerkship directors from all disciplines meet each year in Orlando in October and in Tallahassee in March,

in conjunction with Match Day, to review the clerkships, discuss curriculum updates, and plan changes for future years. Critical to equivalence of clerkship experiences for students is the online clinical data collection system, where students record every clinical contact. Important to the success of this training model is connectivity through audio, video, and online technology among all campuses. The FSU COM library is over 95% electronic and is available at all times, day and night, to all students and faculty wherever they are.

Regional campus clerkship faculty members are chosen from among the local community physicians on the basis of their interest in teaching students. All must be board certified in their specialty and must participate in six hours of faculty development before taking their first student. There is also an ongoing faculty development requirement that must be met for faculty to remain on the clerkship faculty. Clinical preceptors receive \$500 per week per student for their time and efforts working with FSU COM students; they hold parttime clinical faculty appointments in their respective departments and have full access to the FSU COM electronic library materials. Physician clerkship faculty are evaluated by students at the end of each rotation, and campus deans, clerkship directors, and education directors have access to these evaluations for their discipline to allow comparisons across disciplines and campuses. Individual faculty members have online access to three-year summary reports of students' evaluations of their teaching activities.

At present, there are over 2,000 FSU COM clerkship faculty distributed across the regional campuses and other training sites. Faculty retention at these campuses is high (see Table 1). The average retention of faculty across all campuses from the time of their original appointment through 2011 was 84%, comparing very favorably to other medical schools, which often have difficulty attracting and retaining community preceptors.9 Campuses host annual faculty dinners to thank regional faculty for their efforts, to provide an update on the college of medicine activities, and to award best teacher and Guardian of the Mission awards to deserving faculty.

Student Performance and Outcomes

At the beginning of year 2, students participate in a campus assignment, a "mini-match" exercise, in which they are asked to rank regional campuses in order of their preference. A student committee aligns the choices, and students get their campus assignments, based as much as possible on their preferences. On successful completion of the first two years of medical school, and passage of Step 1 of the United States Medical Licensing Examination (USMLE), students move in late June from FSU COM in Tallahassee to the regional campus to which they are assigned. Students are assigned to a clerkship faculty member for each clerkship and train with a physician in all of the sites where she or he practices. FSU COM students' experiences with residents on any clerkship at any location are minimal, and residents have no formal teaching or evaluation role, whether in ambulatory or inpatient settings. As stated previously, approximately 70% of the clinical training occurs in ambulatory settings, in contrast to the majority of medical schools where typically 70% to 80% of the rotations are inpatient and hospital based. For example, in year 3 in 2011, there were 130,926 patient encounters, of which 70.5% were in ambulatory settings, consistent with findings of Green and colleagues'4 article that highlight where patients receive their care (see Figure 2).

During years 3 and 4, the community experience is rich with exposure to many patients with their community physicians and includes a three-week community medicine rotation where students are exposed to the variety of local community health-related organizations. In the 2010 self-study database of the Liaison Committee on Medical Education (LCME), students reported the following average numbers of patient encounters: family medicine, 177; internal medicine, 224; obstetrics-gynecology, 186; pediatrics, 171; psychiatry, 162; and surgery, 255. This community experience was cited in the 2011 LCME report¹⁰ as an area of strength of the FSU COM:

The community faculty apprenticeship model of clinical education provides students with the opportunity to see large numbers of patients, to be involved in all aspects of their care, and to be closely observed for development of competence in their roles as physicians.

Table 1
Retention of Community Faculty at the Six Regional Campuses of the Florida State University College of Medicine (FSU COM), 2001–2011*

	Appointment											
Campus	history	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
Pensacola	No. appointed	9	83	59	33	44	22	35	36	31	23	375
	No. still affiliated	9	61	42	27	32	16	27	34	28	23	297
	% Retained	100	73	71	82	73	73	77	94	90	91	79
Orlando	No. appointed	5	154	83	24	28	56	40	82	53	94	619
	No. still affiliated	4	121	60	16	21	47	36	65	51	93	514
	% Retained	80	79	72	67	75	84	90	79	96	99	83
Tallahassee	No. appointed	7	64	72	56	75	108	61	28	57	41	569
	No. still affiliated	6	55	56	44	65	92	54	28	47	41	488
	% Retained	86	86	78	79	87	85	89	100	82	100	86
Sarasota	No. appointed	·····	·····	·····	75	91	51	54	37	39	31	378
	No. still affiliated	·····	—	····	60	77	43	41	35	39	30	325
	% Retained	·····	·····	·····	80	85	84	76	96	100	97	86
Daytona Beach	No. appointed	·····	—	·····	······	·····	68	66	68	53	32	287
	No. still affiliated	·····	—	·····	·····	·····	62	61	53	51	31	258
	% Retained	·····	·····	·····	······	·····	91	92	78	96	97	90
Fort Pierce	No. appointed	·····	—	·····	······	·····	69	114	47	37	23	290
	No. still affiliated	·····	—	·····	·····	·····	49	97	38	32	22	238
	% Retained	·····	—	·····	······	·····	71	85	81	86	96	82
All campuses	No. appointed	21	301	214	188	238	374	370	298	270	244	2,512
	No. still affiliated	19	237	158	147	195	309	316	253	248	238	2,120
	% Retained	90	79	74	78	82	85	85	85	92	98	84

^{*}These community faculty train FSU COM third- and fourth-year students in required year 3 and year 4 clerkships at the six regional campuses.

A student's performance in each clerkship is assessed by clerkship faculty, patients interacting with the student, and staff in doctors' offices, as well as by performance on exams and performance on the National Board of Medical Examiners clinical subject examinations in each

clerkship's discipline. Official grade assignment across all campuses is done by the education director in each discipline. The students evaluate their preceptors on each rotation, and students' overall evaluations of the clerkship disciplines are also contained in the Association of

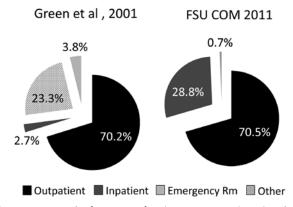


Figure 2 The figure compares the frequency of patient encounters in various locations experienced (1) by students at Florida State University College of Medicine (FSU COM) in 2011 during their third year and (2) by patients seeking health care in the United States, reported by Green et al. ⁴ The figure clearly indicates that FSU COM students and physicians nationally were seeing patients in almost exactly the same proportions in the outpatient location. For details about Green and colleagues' study, please see the article.

American Medical Colleges (AAMC) Graduation Questionnaire (GQ). The 2011 GQ results11 show that FSU COM medical students believe they are receiving an excellent education. In response to "Overall, I am satisfied with the quality of my medical education," 96.3% of responding FSU COM graduates marked "agree" or "strongly agree" compared with 88.9% of responding students at all schools who made that assessment. The 2011 GO response rate for FSU COM, however, was not as high as the national response rate, with a rate of 56% by FSU COM compared with 77% nationally. This may have been a function of student survey fatigue after a very successful LCME selfstudy and site visit in April of that year. Even so, it is clear to us that the extremely positive responses of the FSU COM graduates about their medical education were consonant with the views of most FSU COM graduates. This conviction is strengthened by knowing the percentages of graduates who responded "strongly agree/agree" to the same question on the 2012 GQ,12 which compare in a similar

Table 2

Types of Faculty Members' Involvement With Medical Students in Clerkships, Reported by Members of the Class of 2011, Florida State University College of Medicine (FSU COM), and by Students From All Other U.S. Medical Schools, 2011*

	Percentage of students who strongly agreed/agreed [†]					
Type of involvement, by specialty	From FSwU COM	From all other U.S. schools				
A faculty member personally observed me taking a patient history during the clerkship						
Family medicine	93.4	76.4				
Internal medicine	91.7	75.8				
Obstetrics–gynecology	93.3	58.0				
Pediatrics	95.0	76.4				
Psychiatry	96.7	82.2				
Surgery	95.1	49.4				
Family medicine Internal medicine	96.7 91.7	79.5 79.3				
Obstetrics–gynecology	91.7 96.7					
Pediatrics	95.0	79.5				
Psychiatry	98.3	80.3				
Surgery	93.4	53.9				
Faculty members provided me with sufficient feedback on my performance						
Family medicine	87.1	81.1				
Internal medicine	93.2	85.0				
Obstetrics–gynecology	88.3	66.5				
Pediatrics	90.0	83.0				
Psychiatry	93.4	81.3				
Surgery	93.4	64.7				

^{*}Data are from students' responses to the 2011 Association of American Medical Colleges Graduation Ouestionnaire: used with permission.

way (97.1.% for the FSU COM students, 89.2% for all students). In addition, the student independent self-study for the 2011 site visit had high student participation and showed a high level of satisfaction across the board among the students, and there were no citations of partial or substantial noncompliance in the educational program or medical student areas in the LCME report.

On the GQ, there are 124 questions that allow comparison between the mean ratings by students at the FSU COM and the mean ratings of students at all AAMC schools. On 113 of these 124 questions (91.2%), the ratings by FSU COM students in the class of 2011 were

"higher than/better than" the mean ratings by students at all schools. The percent of FSU COM students who rated their experiences as either "good" or "excellent" on their clinical clerkships were emergency medicine, 90.5%; family medicine, 96.8%; internal medicine, 93.7%; obstetrics—gynecology, 92.0%; pediatrics, 87.3%; and surgery, 96.8%. One mark of the value of the FSU COM educational experience in which students practice directly with preceptors is the greater frequency that students report they are observed and given feedback compared with that of their peers in all schools (see Table 2).

The FSU COM students have a record of excellent performance on all components

of USMLE examinations, exceeding the national pass rate with 94%, 98%, and 99% of first-time takers passing Step 1, Step 2 Clinical Knowledge, and Step 2 Clinical Skills, respectively, validating the clinical training model. The FSU COM students have also done well in matching to residency programs of their choice. Consistent with the FSU COM mission, greater than 42% of all graduates have entered primary care residencies (family medicine, internal medicine, and pediatrics) and more than 55% if obstetrics-gynecology is included. Specifically, in the classes of 2005–2012, out of a total of 567 graduates,

- 78 (13.9%) matched in family medicine,
- 95 (16.9%) matched in internal medicine,
- 73 (13%) matched in pediatrics,
- 67 (11.9%) matched in obstetrics—gynecology,
- 63 (11.1%) matched in general surgery,
- 64 (11.2%) matched in emergency medicine, and
- 125 (22%) matched in all other specialties.

Because of limited residency slots in Florida, greater numbers of graduates are matching out of state, but of the FSU COM graduates who have completed training, over 60% have entered medical practice in Florida, including those who completed residency out of state. Many of these former students returned to the region in which they completed years 3 and 4. Because of the small size of the early classes and the duration of residency training, it is too early in the college's history to have significant data about how many of these students returned to Florida or continued to practice in their original practice regions and specialties, but such data will be of interest for the college in years to come.

Meeting the LCME Standards

FSU COM, the first new MD-granting U.S. medical school of the 21st century, was also the first such school to undergo the LCME continuation-of-accreditation process in 2010–2011. This involved a full four-and-a-half-day site visit by a team of six members in April 2011 to the central

[†]Each percentage is of the number of students who agreed or strongly agreed to each question; that number often varied for each question.

campus and to three of the six regional campuses, as well as to the rural training site in Marianna. In the LCME report, ¹⁰ which stated that the school had a continuation of accreditation for the full eight-year term, five strengths were noted:

- The college is a student-centered, educationally focused organization in which decision making and priority setting are guided by its primary mission to develop exemplary patientoriented physicians.
- 2. The college has a long-standing, wellorganized, and successful program for pipeline development and recruitment of students from diverse backgrounds.
- The community faculty apprenticeship model of clinical education provides students the opportunity to see large numbers of patients, to be involved in all aspects of their care, and to be closely observed for development of competence in their roles as physicians.
- 4. The college has a well-developed program for the recruitment and training of its community faculty, and the retention rate is high, creating a stable educational platform for the clinical program.
- 5. The college should be commended for an impressive faculty development program, particularly for the diverse nature of offerings and the sheer volume of effort expended to support the development of faculty on an ongoing basis.

The LCME report mentioned two areas of noncompliance, one involving the number of basic science faculty required to deliver the basic science curricular content and the other involving language about faculty teaching responsibilities in affiliation agreements. Four areas requiring monitoring were noted. The team found no issues with the FSU COM model of clinical training by community physicians, equivalence across distributed sites, or the lack of residents in teaching roles.

Present Success, Future Challenges

The FSU COM was established at a time of great skepticism about the need for

more physicians in the United States and the proposed new model of community-based education in ambulatory settings using community physicians as medical educators. Ten years later, the need to train more physicians is now recognized, and FSU COM has led the increase in the number of U.S. medical schools from 2000 to 2015 that future generations may call the second great expansion of post-Flexnerian medical education.¹³

The call by Flexner to return medicine to its roots in science and inquiry reflected the mediocre quality and profit motive of many schools and teachers in his day.14 The Flexner Report² led directly to the long-standing and strongly held view that students must learn clinical medicine primarily from full-time academic faculty on the inpatient services of teaching hospitals. Although most medical schools have altered their approach to clinical education in the past 15 years by instituting earlier clinical exposure and more ambulatory experiences,9 the hospitalbased academic medical center is still the model. Midway through the decade 2000-2010, Whitcomb⁵ called for a revisiting of the Flexner Report, suggesting that arguments that "medicine has to be learned on the inpatient services of hospitals fail to appreciate fully Flexner's views." The modern emphasis on ambulatory training at FSU COM by primary care and specialty practicing physicians who are board certified in their disciplines is entirely consistent with Flexner's views, and the results reported herein validate this model of training future physicians.

The challenge going forward is to sustain this model, both in keeping sight of the mission of the FSU COM and maintaining the state funding to support it. State support, which diminished over the past four years, reflecting the flagging Florida economy, has been offset with increased revenue through full enrollment and modest increases in tuition, along with strong growth in the research enterprise. The highly popular community-based model, strongly supported by both preceptors and students, should guarantee the focus on ambulatory training and staying true to the FSU COM's mission.

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