



# Performance of Third-Year Medical Students on a Rural Family Medicine Clerkship

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**BACKGROUND AND OBJECTIVES:** In 1999 the University of Kansas School of Medicine established a rural option for the required family medicine clerkship to increase student exposure to rural locations. The emphasis at these sites was in experiential learning, and students did not attend lectures. To assure that students who chose the rural option were receiving an equivalent educational experience, we compared the performance of rural students to their peers that received the standard clerkship experience.

**METHODS:** We used data from family medicine clerkship students during 1999–2011 to compare rural students with those that remained on the main campus. Comparison of the groups was made with regard to previous academic performance and demographic data to assess for initial differences. While the rural students were more likely to be Caucasian, there was otherwise no statistical significance between the groups. We then compared their National Board of Medical Examiners (NBME) exam performance and their overall grade.

**RESULTS:** Students who chose a rural location had a significantly higher clerkship grade. This was due to higher clinical evaluations.

**CONCLUSIONS:** Students who completed a rural family medicine clerkship are not at an academic disadvantage. There are many possible explanations for better clinical evaluations, and a comparison of performance on the clinical skills assessment would be useful to determine whether the increased clinical experience during the rural option created a difference in clinical skills.

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The number of rural physicians in Kansas is below the national average, and our medical school is struggling to meet the needs of rural populations. Medical students are more likely to consider rural practice if they have frequent, early exposure to rural locations during their education.<sup>1</sup> In 1999, the University of Kansas School of Medicine (KUSOM) developed rural options for many of the required clerkships, including family

medicine, to increase student exposure to rural learning environments. To determine if the rural students were receiving equivalent educational experiences, we compared rural students to a matched cohort of their peers who completed the standard clerkship experience. We used local and national benchmarking to assess any disadvantage to a rural option for a single clerkship. Our objective was to determine whether students who chose a rural family medicine

option performed as well on clinical evaluations and knowledge acquisition as their peers who remained in an urban setting.

## Methods

Students at the KUSOM have the choice of a rural location for clerkships in family medicine, surgery, pediatrics, and obstetrics-gynecology. Family medicine is an 8-week, required clerkship. The university has three clinical campuses, but this study only included students from the Kansas City campus. Student assignments are coordinated through the Office of Rural Medical Education and based on availability of rural sites. Sites provide housing and meals. Each site goes through a vetting process, including a site visit, volunteer faculty appointments, and an affiliation agreement. Volunteer faculty are provided with competencies, goals, objectives, and evaluation criteria for the clerkship.

All students spend the first week and last week on the Kansas City campus. During the first week, students have orientation and skills workshops (musculoskeletal, radiographs, casting, and suturing).

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During the last week, students return to the main campus for testing. The intervening 6 weeks are largely clinical work. For the rural students this is with their rural preceptor. For Kansas City students, this time is split between a community preceptor and clinics in the Department of Family Medicine. Students in Kansas City also receive a weekly 3-hour didactic session on family medicine topics. Students at rural locations have access to written materials but were unable to participate directly in the didactics.

Grading at each site is the same. Fifty percent of the student's final grade is from clinical evaluations. In Kansas City this is split equally between evaluations from their community preceptor and department faculty. For rural students it is entirely from their rural preceptor. The National Board of Medical Examiners (NBME) shelf is worth 20%, an OSCE is 10%, and the final 20% is a case presentation.

We analyzed data on students from the years 1999–2011, the years that the rural option has been

available. This included pre-matriculate data, medical school academic performance, and demographic data. Two groups were identified: students who stayed on the Kansas City campus and those who went to a rural location. We compared scores on the family medicine NBME subject exam and on the overall clerkship grade.

The KU Human Subjects Committee granted approval of this project with a waiver of consent.

## Results

There were 1,624 students who stayed in the Kansas City campus and 79 who went to a rural location. There was no difference in gender, basic science GPA, or United States Medical Licensing (USMLE) Step 1 scores. Rural students were more likely to be Caucasian (see Table 1). There was no significant difference in the NBME shelf exam performance of these two groups ( $P=0.36$ ). The students who completed the rural clerkship had a significantly higher clerkship grade (3.48 versus 3.29,  $P=.006$ ) (See Table 2).

## Discussion

We wanted to ensure that the rural experience did not cause a disadvantage for students when taking the NBME shelf examination. The emphasis at rural sites was in experiential learning, and the students did not have “live” didactics lectures, although they had full access to written and web-based resources. This did not seem to negatively affect their performance.

Students who chose to complete their family medicine rotation at a rural site scored the same on a national knowledge assessment examination as students who remained at the urban campus, but the rural students had higher overall grades. The higher grade may be attributed to higher clinical evaluations.

A limitation of this analysis is that the students were not randomly assigned to a rural versus urban site. There were no obvious pre-clerkship academic differences in the rural students, but there may be some inherent differences that were not measured. There are other possible explanations for the differences. A

**Table 1: Academic and Demographic Data of Students Who Do a Rural Rotation in Comparison to Those on the Main Campus**

Measure	No Rural Rotation			Rural Family Rotation			Significance	
	n	Mean	SD	n	Mean	SD	P Value	Effect Size
MCAT								
Verbal reasoning	1,624	9.09	1.80	79	9.14	1.75	.81	.03
Physical science	1,624	8.92	1.41	79	9.10	1.65	.36	.13
Biological science	1,624	9.36	1.51	79	9.16	1.42	.26	.13
MCAT sum	1,624	27.38	7.10	79	27.41	3.89	.94	.00
Undergraduate GPA								
Science	1,616	3.57	.37	79	3.58	.33	.75	.03
Cumulative	1,616	3.64	.31	79	3.65	.29	.62	.03
KU Basic Science GPA	1,624	3.19	.55	79	3.08	.54	.07	.20
Initial Step 1 score	1,624	214.19	21.73	79	213.57	18.83	.80	.03
% passing Step 1	1,624	93%		79	95%		.58	.10
% Male	1,623	56%		79	52%		.36	.09
% Caucasian	1,575	76%		79	87%		.01	.35

SD—standard deviation  
MCAT—Medical College Admission Test  
GPA—grade point average  
KU—University of Kansas

**Table 2: Family Medicine Clerkship Grade and Shelf Exam Performance of Students Who Do a Rural Rotation in Comparison to Those on the Main Campus**

Measure	No Rural Rotation			Rural Family Rotation			Significance	
	n	Mean	SD	n	Mean	SD	P Value	Effect Size
Family medicine grade	1,624	3.29	0.58	79	3.48	0.60	.006	.33
Family medicine shelf exam	1,624	73.44	7.17	79	74.20	6.50	.36	.11

rural preceptor evaluates four to six students a year. Faculty members at the Kansas City campus provide clinical evaluations for all 120 third-year medical students, which may give a broader perspective of students' clinical performance. Another factor may be the personal relationship with the rural preceptor. In some cases, students return to the communities where they were raised to work with physicians they have known all of their lives. This may make it harder for the rural physicians to give lower clinical evaluations. It is also possible that the intensive nature of the rural experience brings out better clinical performance for the students who choose it.

We are not the first to have this concern with providing rural students with an equitable educational experience. Studies of rural track experiences have evaluated 7–12 months spent in rural locations and found similar performance

on USMLE Step 2 CK and CS, OSCEs, and written examinations.<sup>2-5</sup> Rural students did demonstrate improvements in rapport building.<sup>4,6</sup> Most of the prior studies or rural track programs did not look at performance of students in a single rural clerkship. Although, a study of an 8-week rural preceptorship found that NBME shelf scores were not affected by the population density of the medical students' rotation site.<sup>7</sup>

Our study demonstrates that students choosing a rural family medicine clerkship were able to perform at the same or higher level than students choosing an urban-based clerkship.

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