Comparison of Medical School Performance between Students Admitted Through

Two Different Admission Routes

BY

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THESIS

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LIST OF ABBREVIATIONS

AAMC — American Association of Medical Colleges

AMS — The Warren Alpert Medical School of Brown University

GPA — Grade Point Average

HHMI — Howard Hughes Medical Institute

MCAT — Medical College Admission Test

MD — Doctorate of Medicine

NBME — National Board of Medical Examiners

PLME — Program in Liberal Medical Education

SAT — Scholastic Achievement Test

USMLE — United States Licensing Examination

SUMMARY:

Students in the Program in Liberal Medical Education (PLME) at Brown University enroll in a combined eight-year baccalaureate/medical degree program. There are no grade point average requirements or medical college admission test requirements for students admitted in the PLME. There are few studies comparing outcome measures between students admitted through standard routes of admission to medical school and those admitted through combined baccalaureate/medical degree programs such as the PLME.

Our purpose was to determine whether students admitted through the Program in Liberal Medical Education (PLME) performed as well on both cognitive outcome measures (such as pre-clinical performance, clinical performance and performance on licensing examinations) and non-cognitive outcome measures (such as admission to the Golden Humanism Society and professionalism ratings) as standard admission students.

We compared students admitted to the Warren Alpert Medical School of Brown University (AMS) through the PLME (n=184) and through the standard admission route (n=87). Members of the graduating classes of 2010, 2011 and 2012 were compared for a number of cognitive and non-cognitive measures, including preclinical Year 1 and Year 2 average examination grades, licensing examination scores (both Step 1 and Step 2), admittance into honor societies such as Alpha Omega Alpha and the Golden Humanism Society, and competitive residency specialty placements.

There were no differences in preclinical Year 1 and Year 2 grade averages or competitive residency specialty placements between the PLME and standard admission students. Standard admission students outperformed PLME students on Step 1 (235.0 to 219.1, p<0.001), Step 2 Clinical Knowledge (244.5 to 233.8, p<0.001), admission to Alpha Omega Alpha (20.7% to 10.8%, p=0.003) and admission to the Golden Humanism Society (25.3% to 14.7%, p=0.034). These results remain consistent, even after controlling for age, ethnicity, and number of undergraduate courses taken.

We conclude that students admitted through the standard admission route outperform students admitted through a combined eight-year baccalaureate/medical degree program at one American medical school on many measures, most related to standardized testing   There is no difference between competitive residency placements between the two cohorts.

I.   INTRODUCTION:

There is growing debate reported in the medical literature and in society as to what training a premedical student should receive prior to entering medical school[1,2,3]. Recently, the Howard Hughes Medical Institute (HHMI) and the Association of American Medical Colleges (AAMC) released a report outlining scientific competencies they believed premedical students should achieve prior to entering medical school[1]. These competencies were compiled, in part, to standardize the premedical curriculum prior to entering medical school. In addition, beginning in 2015, the Medical College Admissions Test (MCAT) is changing its test blueprint to decrease emphasis on the sciences and increase emphasis on the "psychological, social and biological foundations of behavior, recognizing the importance of socio-cultural and behavioral determinants of health and health outcomes[2]".

The Warren Alpert Medical School of Brown University (AMS) introduced the Program in Liberal Medical Education (PLME) in 1985 to implement the curricular goals that MCAT is beginning to assess 30 years later. The goal of the PLME is to encourage "students of medicine to pursue their varied interests (in humanities, social sciences, or natural sciences) in depth.[4]" Students admitted to the PLME are guaranteed admittance to medical school from high school without a grade point average or MCAT requirement.   Students in this eight-year program receive both a baccalaureate degree and a medical degree. According to information on the AAMC website, there are 43 different combined baccalaureate/MD programs (some of which are accelerated, lasting either 6 or 7years) in the United States. This number differs from numbers reported in a recent review article, which lists the number of programs as 87[5,6]. The PLME is

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the largest of such programs in the United States, based on approximately 50 to 55 students admitted to medical school annually.

There are very few studies that compare outcomes between students enrolled in combined baccalaureate/MD programs and students admitted through standard routes in either eight year programs or accelerated programs. The most comprehensive study to date focused on retention rates, attrition rates, average grade point averages and NBME performance (the predecessor to the current United States Medical Licensing Examination, otherwise known as USMLE) in six schools with combined programs[7]. However, this study did not present any quantitative data on performance or any comparison with traditional programs. A more recent review presented the mission and goals of combined baccalaureate-MD programs without examining outcome data. The mission and goals included targeted recruitment, improved premedical environment, educational efficiency and achievement of societal and professional goals[6].

An older study described outcome measures of a six-year program at the University of Missouri-Kansas City[8]. The authors describe the hallmarks of their program, including early clinical exposure for students prior to enrolling in medical school. The study compared graduates of their program to graduates of more traditional programs. This comparison showed that graduates of this six-year program performed better in areas such as problem solving and professionalism than graduates of more traditional programs[8].

Other studies have examined attitudinal differences between students admitted through a combined route and a standard route, with respect to their views about society[9]. Graduates of accelerated programs, e.g., six year programs, thought they were better prepared for practice in comparison to those of lengthier combined baccalaureate/MD programs. Graduates of accelerated combined programs also taught more and were more engaged in their communities

than other graduates from combined programs, but engaged less in scholarly activity such as becoming academic faculty[9]. However, this study was conducted in the 1980s, and it is unclear whether the conclusions are applicable for current academic settings and standards in medical education.

There are other, even older, studies that have examined combined programs. One of these, conducted in the 1970s, focused on Boston University School of Medicine's six-year accelerated program. This article provided a descriptive overview of the admission requirements for the program and the flexibility offered to students[10]. Another study, published in 1976, concluded that accelerated combined baccalaureate/MD programs are generally successful[11].

The goal of this study is to compare a number of cognitive and non-cognitive outcomes of students admitted through a combined baccalaureate/MD program and students admitted through the traditional route (see Table I for a comparison of admission requirements at AMS for the two routes), to examine differences in preclinical performance, clinical performance, residency placement and other variables reflecting success in medical school. Specifically, our objectives are to address the following research questions:

1. Is there a difference in preclinical performance between students from different routes of admission (combined baccalaureate/MD versus standard route of admission)?

2. Is there a difference in clinical performance by routes of admission?

3. Is there a difference in licensing examination scores (such as on the United States Medical Licensing Examination or USMLE Step 1, USMLE Step 2 Clinical Knowledge and USMLE Step 2 Clinical Skills) by routes of admission?

4. Is there a difference in other measures of medical school success, such as professionalism, specialty choice, admission to the Golden Humanism Society or Alpha Omega Alpha, by routes of admission?

II.   METHODS:

We received exempt status for this study from the Internal Review Boards at Brown University and the University of Illinois-Chicago.

A. Study Population:

Medical students who graduated from AMS and admitted through either PLME or the standard admission route in 2010, 2011 and 2012 were included in our study (N=271; PLME = 184; Standard admits = 87). We used available demographic information, including age and ethnicity (coded as either underrepresented minority or non-underrepresented minority) in our analysis. Because Brown University does not calculate grade point averages, and because AMS does not require the MCAT for PLME students, we did not include these premedical performance measures in our analysis. We de-identified all student data to ensure student anonymity in the study.

B. Outcome Variables:

The primary outcome variables in this study were performance in the preclinical curriculum (average scores from Years 1 and 2; grades in the Doctoring course); licensing examination scores (USMLE Step 1, USMLE Step 2 Clinical Knowledge, USMLE Step 2 Clinical Skills); clerkship SHELF exam scores (on Internal Medicine, Obstetrics and Gynecology, Pediatrics, Psychiatry and Surgery); number of clerkship honor grades; admittance to national honor societies (Alpha Omega Alpha and the Golden Humanism Society); AMS professionalism evaluations; and placement in competitive residencies. For placement in competitive residencies, we coded residency specialties with USMLE Step 1 average scores of 240 or greater as more competitive, and residency specialties with USMLE Step 1 average scores

of less than 240 as less competitive, as a proxy measure for competitiveness based on National Resident Matching Program data[12]. Table II presents a list of independent and dependent variables. For professionalism, we used the rating scale from the Internal Medicine clerkship overall course evaluation; Internal Medicine is the longest clerkship at AMS (12 weeks), allowing for the longest observation period of professional behaviors. Because the rating criteria (i.e., the question asked of evaluators on a 6-point rating scale) differed in 2010 from 2011 and 2012, we conducted two separate analyses for the two different scales.

C. Analysis:

We used SPSS Version 20 (SPSS, Inc., 20011, Chicago, IL, www.spss.com) to analyze data. We examined descriptive statistics and used unadjusted tests of means and proportions (independent t-tests and chi-square tests) to compare the PLME and standard admission route students. We then performed multiple logistic regression analysis for dichotomous outcome measures such as Step 1 pass or fail decision, Step 2 Clinical Skills pass or fail decision, Alpha Omega Alpha membership, Golden Humanism Society membership, Doctoring course score and competitive resident placement, controlling for age, underrepresented minority status and total number of premedical science courses. We controlled for number of premedical science courses because we did not have scholastic achievement test (SAT) data for our standard admission students and we did not have MCAT data for our PLME students as they do not take this test. As noted above, Brown University does not calculate a GPA for its undergraduate students, so we could not compare GPAs between standard admission students and PLME students.

We used multiple linear regression analysis for continuous outcome measures such as Step 1 score, Step 2 Clinical Knowledge score, preclinical Year 1 average score, preclinical Year

2 average score, combined preclinical Year 1 and Year 2 average score, SHELF exam scores from the five aforementioned clerkships, average number of clerkship honor grades and professionalism ratings, controlling for age, underrepresented minority status and total number of premedical science courses to examine continuous variables. We reported standardized beta coefficients, because the units between independent and dependent variables were different.

III. RESULTS:

We present demographic information for the PLME and standard admission students in Table III. Students in the standard admission route were less ethnically diverse; took more traditional premedical courses prior to medical school (Biology, Chemistry, Math and Physics) and were more likely to major in a science discipline than PLME students.

Tables IV and V present descriptive statistics for the PLME and standard admission students. Standard admission students, in the unadjusted analysis, were more likely to be members of Alpha Omega Alpha and the Golden Humanism Society than PLME students. The standard admission students outperformed the PLME students on Step 1, Step 2 Clinical Knowledge, SHELF examinations from Internal Medicine, Obstetrics and Gynecology, Pediatrics, Psychiatry and Surgery, number of clerkship honors grades, and Doctoring honors grades. There were no statistically significant differences between the PLME students and the standard admission students in competitive residency placements, in preclinical performance in Years 1 or 2, on passing rates for Step 1 and Step 2 CS and in professional ratings.

After adjusting for age, underrepresented minority status and total number of premedical science courses, we found the same results as in the unadjusted data. These results are presented in Tables VI and VII.

IV. DISCUSSION:

To our knowledge, this is the first study of outcome measures in the last 15 to 20 years of a combined baccalaureate/MD program, as compared with a standard premedical admission route. The results of this study demonstrate that students who enter AMS through the standard route of admission outperform students who enter through the PLME on a number of measures, many of which are related to ability to take standardized examinations, although others are focused on humanism in medicine, such as admission to the Golden Humanism Society.

One can argue that despite this outcome data, ultimately medical schools are preparing students for residencies. In this regard, the PLME students and the standard admission students perform similarly – there were no statistically significant differences between the two groups' matching to competitive residencies.

There are a number of potential explanations for these study results. A somewhat simplistic argument may be made that students admitted through the standard route are more familiar with taking standard examinations, having had to take the MCAT prior to entering medical school, and this gives these students greater facility in taking licensing examinations such as Step 1 and the SHELF examinations (which then impact whether a student gets honors in a course or not). However, it is reasonable to expect this effect to be less pronounced in the clerkship years (on the SHELF exams and on Step 2 Clinical Knowledge), once all students take USMLE Step 1.

Another potential, more sophisticated, explanation is that the premedical process effectively shapes students for both the cognitive and the non-cognitive aspects of medical

school achievement and assessment. The PLME program is very competitive, with an admissions rate of less than 3%, but students in this program then have a relatively low stress undergraduate education with no grade point average or MCAT requirement. Conversely, standard admission students are not only expected to excel academically overall and in their premedical science courses, but also to undertake service activities, such as volunteering in a hospital setting. Even after controlling for the number of science courses a student took prior to medical school, there were no significant or meaningful differences in most outcome measures. It is possible that this premedical process somehow more effectively shapes future physicians than we thought, beyond basic science courses, and has possible implications for the AAMC/HHMI report on scientific competencies and the revision of the MCAT. This will need to be studied in future research.

The PLME program allows for a naturalistic comparison of medical school outcomes between students who enrolled in a rigorous premedical program, such as the standard admission students, and those who do have GPA or MCAT requirements. Although not reported in the literature, it is possible that schools with combined baccalaureate/MD programs that require a minimum MCAT score (or the MCAT at all) and a minimum GPA may find different results than the findings presented in this study.

There are limitations to our study. We cannot adequately compare student performance prior to medical school in relation to admissions route. Brown University does not calculate grade point averages for students and the PLME students do not take the MCAT. We, thus, could not compare or control for these variables in our analysis. In addition, although we do have data on PLME student performance on the scholastic aptitude test (SAT), we do not have this same data for the standard admit students, negating this comparison. Additionally, we

conducted this analysis at a single site limiting its generalizability to other settings. Finally, our ranking of residency specialty programs is based on a single measure, USMLE Step 1 score. However, this is a known measure of specialty competitiveness[11] and no rating of residency programs exists to our knowledge.

In conclusion, although it appears that students admitted through a standard route outperform students admitted through the PLME, further studies are necessary. These studies could be performed individually at each of the 87 schools offering these programs or collaboratively amongst institutions. In addition, it is possible that making minor modifications to undergraduate curricula may impact performance in medical school significantly. For example, at AMS, after anecdotally noting that our PLME students performed less well than standard admits, we instituted a three biology course requirement where students need to attain a B or above, to be admitted to AMS. These types of curricular modifications also warrant further study.

Table I:

COMPARISON OF ADMISSION REQUIREMENTS FOR PLME AND STANDARD ADMISSION ROUTES

Admissions Requirements	PLME	Standard
Grade Point Average	No	Yes
Medical College Admissions Test	No	Yes
Biology courses	Yes	Yes
Non-biology science courses	Yes	Yes
Declaration of college major	Yes	Yes
Application to medical school	No	Yes
Interview	No	Yes

Table II:

INDEPENDENT AND DEPENDENT VARIABLES COMPARING PLME AND STANDARD ADMISSION ROUTES

Independent variable		Dependent variable	
Variable	Measure	Performance indicator	Measure
Route of admission	PLME versus traditional route	Preclinical curriculum	Year 1 scores Year 2 scores Year 1 and 2 combined score Doctoring Honors Grade
Control variables	Gender	Clinical curriculum	Clerkship grades SHELF exam scores Number of honors grades
	Age	Licensing exam scores	Step 1 score Step 2 CK score Step 2 CS score
	Race/ethnicity Number of premedical science courses	Medical school success	Admission to Alpha Omega Alpha Admission to Gold Humanism Society Professionalism evaluations Participation in a scholarly concentration Competitive residency placements

Note: Control variables are included to control for the effect of demographic factors.

Table III:

DEMOGRAPHIC COMPARISON BETWEEN PLME AND STANDARD ADMISSION ROUTE STUDENTS

Demographic Information	PLME (N=184)	Standard Deviation	Standard (N=87)	Standard Deviation	P-value
Underrepresented minority status	22.3%	NA	8.0%	NA	0.004
Science Major	39.7%	NA	83.9%	NA	<0.001
Age	21.9	0.6	23.6	3.2	<0.001
Mean Number of Premedical Biology Courses	4.0	3.0	7.4	3.7	<0.001
Mean Number of Premedical Chemistry Courses	2.4	1.5	4.5	2.3	<0.001
Mean Number of Premedical Math Courses	0.7	0.9	2.1	1.7	<0.001
Mean Number of Premedical Physics Courses	1.0	0.9	2.1	1.2	<0.001
Mean Number of Total Premedical Science Courses	8.1	4.0	15.9	5.7	<0.001

Note: Values in underrepresented minority status and science major represent column percentages; the p-values are derived from the Chi-squared test of proportions. For all remaining demographic variables, values represent means; p-values were derived using the independent t-test.

Table IV:
COMPARISON OF OUTCOME MEASURES BETWEEN PLME AND STANDARD
ADMISSION STUDENTS ON DICHOTOMOUS VARIABLES

Outcome Measure	PLME (N=184)	Standard (N=87)	P-value
Alpha Omega Alpha Society Membership	**10.8%**	**20.7%**	**0.003**
Golden Humanism Society Membership	**14.7%**	**25.3%**	**0.034**
Competitive Residency Placement	19.6%	20.5%	0.908
Enrolled in Scholarly concentration	31.0%	34.5%	0.107

Note: Values represent column percentages. P-values were derived from a Chi-squared test of proportions.

Table V:

COMPARISON OF MEAN OUTCOME MEASURES FOR PLME AND STANDARD ADMISSION ROUTES: DESCRIPTIVE STATISTICS AND T-TEST

Variable	PLME				Standard				Mean Difference	p-value
	Mean	**SD**	**Min**	**Max**	**Mean**	**SD**	**Min**	**Max**		
Year 1 average score	83.8	6.4	66	96	85.5	4.6	74	94	1.7	0.102
Year 2 average score	84.4	6.8	68	98	86.16	7.9	73	96	1.7	0.094
Year 1 and Year 2 combined average score	84.2	6.4	68	97	85.84	7.5	74	95	1.6	0.091
Step 1 score	219.1	23.6	130	265	235.0	17.9	175	268	13.9	<0.001
Step 2 CK score	233.8	21.6	172	280	244.5	18.3	172	276	10.7	<0.001
Internal Medicine SHELF exam score	75.5	7.6	56	99	80.41	7.3	63	98	1.9	<0.001
Obstetrics and Gynecology SHELF exam	74.4	8.7	44	99	77.2	8.4	53	97	2.8	0.001
Pediatrics SHELF exam score	74.0	9.3	52	99	78.6	8.5	54	99	4.6	<0.001
Psychiatry SHELF exam score	80.3	8.7	60	99	82.9	7.67	64	99	2.6	0.020
Surgery SHELF exam score	74.6	8.9	55	99	78.9	8.6	55	99	4.3	<0.001
Average SHELF score	75.8	7.0	63	99	79.6	634	60	91	3.6	<0.001
Total Number of Clerkship Honors Grades	1.72	1.77	0	7	2.53	2.07	0	7	0.81	0.001
Professionalism Rating (Class of 2010)	2.41	0.525	1	3	2.61	0.535	1	3	0.20	0.643
Professionalism Rating (Class of 2011 and 2012)	2.42	0.529	1	3	2.53	0.504	2	3	0.13	0.680

Note: P-values are from independent t-test.

Table VI:
LOGISTIC REGRESSION: ODDS RATIOS

Outcome	Variables	Unadjusted Odds Ratio	Unadjusted p-value	Adjusted: Age and URM status Odds Ratio	Adjusted: Age and URM status p-value	Adjusted: + Number of science Odds Ratio	Adjusted: + Number of science p-value
Doctoring Honors	Age			0.772	0.030	**0.773**	**0.022**
	URM			1.74	0.159	1.73	0.160
	Standard vs. PLME	1.48	0.158	**1.95**	**0.030**	1.884	0.106
	Number of Science Courses					1.00	0.882
AOA	Age			0.846	0.163	0.841	0.156
	URM			3.52	0.096	3.535	0.094
	Standard vs. PLME	**2.75**	**0.004**	**3.06**	**0.003**	**3.40**	**0.014**
	Number of Science Courses					0.987	0.737
Golden Humanism	Age			1.07	0.707	1.06	0.451
	URM			1.19	0.139	1.21	0.678
	Standard vs. PLME	**1.97**	**0.036**	1.69	0.144	**2.51**	**0.041**
	Number of Science Courses					0.950	0.143
Competitive Residency	Age			0.741	0.068	**0.708**	**0.042**
	URM			1.73	0.341	1.80	0.312
	Standard vs. PLME	1.04	0.908	1.39	0.387	2.43	0.085
	Number of Science Courses					0.935	0.106

Key: URM = Underrepresented Minority Group

Table VII:

LINEAR REGRESSION: STANDARDIZED REGRESSION COEFFICIENTS

Outcome	Variables	Unadjusted		Adjusted: Age and URM		Adjusted: + Number of science	
		Beta	p-value	Beta	p-value	Beta	p-value
Step 1 Score	Age			-0.130	0.033	-.113	0.063
	URM			0.297	<0.001	0.295	<0.001
	Standard vs. PLME	0.325	<0.001	0.330	<0.001	0.213	0.005
	Number of Science Courses					0.184	0.008
Year 1 GPA	Age			0.117	0.173	0.122	0.159
	URM			0.164	0.041	0.163	0.042
	Standard vs. PLME	0.131	0.102	0.062	0.474	0.015	0.892
	Number of Science Courses					0.072	0.479
Year 2 GPA	Age			0.081	0.349	0.088	0.309
	URM			0.172	0.032	0.171	0.033
	Standard vs. PLME	0.134	0.094	0.078	0.367	0.005	0.961
	Number of Science Courses					0.072	0.274
Year 1 and Year 2 Combined Average	Age			0.100	0.244	0.106	0.219
	URM			0.173	0.031	0.172	0.032
	Standard vs. PLME	0.136	0.091	0.072	0.407	0.011	0.920
	Number of Science Courses					0.093	0.361
Step 2 CK Score	Age			-0.142	0.034	-0.130	0.053
	URM			0.224	0.001	0.222	<0.001
	Standard vs. PLME	0.244	<0.001	0.270	<0.001	0.189	0.026
	Number of Science Courses					0.124	0.111
Internal Medicine SHELF Score	Age			-0.144	0.024	-0.137	0.033
	URM			0.150	0.011	0.149	0.012
	Standard vs. PLME	0.294	<0.001	0.328	<0.001	0.283	<0.001
	Number of Science Courses					0.78	0.339
Obstetrics and Gynecology SHELF Score	Age			-0.036	0.586	-0.034	0.611
	URM			0.168	0.006	0.162	0.006
	Standard vs. PLME	0.205	0.01	0.193	0.004	0.179	0.030
	Number of Science Courses					0.022	0.775

Measure	Variable	r	p	r	p	r	p
Pediatrics SHELF Score	Age			-0.084	0.195	-0.075	0.247
	URM			0.202	0.001	0.201	0.001
	Standard vs. PLME	0.233	<0.001	0.234	<0.001	0.176	0.029
	Number of Science Courses					0.090	0.226
Psychiatry SHELF Score	Age			0.003	0.968	0.001	0.994
	URM			0.211	0.001	0.211	0.001
	Standard vs. PLME	0.144	0.020	0.111	0.099	0.097	0.245
	Number of Science Courses					0.022	0.772
Surgery SHELF Score	Age			-0.056	0.396	-0.045	0.494
	URM			0.160	0.009	0.157	0.010
	Standard vs. PLME	0.227	<0.001	0.224	<0.001	0.150	0.068
	Number of Science Courses					0.115	0.130
Average SHELF Exam Score	Age			-0.082	0.203	-0.072	0.262
	URM			0.228	0.001	0.226	<0.001
	Standard vs. PLME	0.259	<0.001	0.255	<0.001	0.189	0.019
	Number of Science Courses					0.102	0.168
Average Number of Clerkship Honors	Age			-0.069	0.293	-0.070	0.291
	URM			0.220	<0.001	0.220	<0.001
	Standard vs. PLME	0.199	0.001	0.191	0.004	0.197	0.017
	Number of Science Courses					0.010	0.899
Professionalism Evaluation 2011 and 2012	Age			0.063	0.460	0.063	0.462
	URM			0.100	0.195	0.100	0.197
	Standard vs. PLME	0.097	0.205	0.056	0.637	0.057	0.593
	Number of Science Courses					0.002	0.986
Professionalism Evaluation 2010	Age			-0.026	0.806	-0.322	0.008
	URM			-0.255	0.023	-0.020	0.845
	Standard vs. PLME	0.180	0.086	0.282	0.014	0.417	0.004
	Number of Science Courses					-0.200	0.130

Key: URM = Underrepresented Minority Group

V.   CITED LITERATURE:

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VI. VITA

Name: Paul George, MD

Education:

Residency: Brown Family Medicine Residency, Memorial Hospital of Rhode Island (2005-2008)

Medical School: Alpert Medical School of Brown University, Providence, RI (2001-2005)

Undergraduate: Brown University, Providence, RI (1997-2001)

Teaching:

Assistant Professor of Family Medicine, Brown University (2010-present)

Adjunct Clinical Associate Professor of Pharmacy Practice, University of Rhode Island (2011-present)

Honors:

Faculty Marshall, elected by graduating medical school class (2012)
New Faculty Scholar Award, Society of Teachers of Family Medicine (2011)
Family Medicine Interest Group National Program of Excellence Award Winner (2011)
Community Preceptor of the Year, Brown Family Medicine Residency (2009)
Dean's Teaching Excellence Award, Alpert Medical School of Brown University (2009, 2011, 2012)

International Presentations:

George P, MacNamara MMC, Taylor JS. A novel virtual family curriculum to teach specialty-specific clinical skills to rising third-year medical students. International Clinical Skills Conference, Prato, Italy, 2013.

MacNamara MMC, Gainor J, George P, Taylor JS. Effective self assessment methods for third-year medical students in a transition course. International Clinical Skills Conference, Prato, Italy, 2013.

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MacDonnell C, George P, Rege S,Misto K. Advancing interprofessional practice through preclinical educational experience. International Conference on Education, Research and Innovation , Madrid, Spain, 2012.

Reis S, George P, Anandarajah G, Nothnagle M. Using a learning coach and reflection forum to

develop self-directed learning skills among residents. WONCA EUROPE Conference, Vienna, Austria, 2012.

Taylor JS, Reis SP, George PF, Wald HS, Borkan JM. Training medical students to perform intimate physical exams: Instruction and reflection. International Clinical Skills Conference, Prato, Italy, 2011.

George PF and Nothnagle M. Teaching Residents Evidence Based Medicine Using a Learning Coach. Society of Teachers of Family Medicine National Conference, Vancouver, British Columbia, 2010.

National Presentations:

Anthony D, Taylor JS, George P, MacNamara M. Evaluation of an intervention to enhance student interest in care of the underserved. Society of Teachers of Family Medicine Medical Student Education Conference, San Antonio, TX, 2013.

George P. Recruiting your replacement. Cultivating the Family Medicine Pipeline. American Academy of Family Physician Scientific Assembly, Philadelphia, Pennsylvania, 2012.

Garg A, Reddy S, Powers J, Jacob R, Wilson L, Belazarian , Dominguez E, George P, Robinson-Bostom L, Avashia N, Wise E, Wang J, Geller A. The Skin Cancer Objective Structured Clinical Examination (SCOSCE): A multi-institutional collaboration to develop and validate a clinical skills assessment for suspicious pigmented lesions. Association of Professors of Dermatology Annual Meeting, Chicago, 2012.

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Benson J, Egan M and George, P. Family Medicine Recruitment Pipeline: What Can Your Program Do About It? Society of Family Medicine National Conference, Seattle, Washington, 2012.

Seagrave M, Franklin R, Bower D, George PF, Hulbert K, Anthony D. The Reality of Virtual Patient Cases: Four Family Medicine Clerkships' Experiences Integrating fmCASES. Annual STFM Conference on Medical Student Education, Long Beach, CA, 2012.

George PF, Taylor JS, Anthony D. Going Paperless in a Family Medicine Clerkship: Preparing an Online Curriculum for Use on iPads. Annual STFM Conference on Medical Student Education, Long Beach, CA, 2012.

George PF, Taylor JS, Anthony D. Reinvigorating the Journal Club in Undergraduate Medical Education. Annual STFM Conference on Medical Student Education, Long Beach, CA, 2012.

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George PF, Farrell T and Lekander M. Transitioning from residents to academic faculty: How to say yes (and no). Society of Teachers of Family Medicine National Conference, New Orleans, LA, 2011.

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Regional Presentations:

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Krishnan S, Tofte J, Taylor JS, George P, Dollase R. A student-created study materials website. Northeast Group on Educational Affairs Annual Retreat, Weill Cornell Medical College, New York, NY, 2013.

Patel N, Gainor J, MacNamara MC, George P, Taylor JS. An intensive medical education elective for senior medical students. Northeast Group on Educational Affairs Annual Retreat, Weill Cornell Medical College, New York, NY, 2013.

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MacNamara M, Hart J, George PF, Taylor JS, Anthony D. Using FMIG to increase the Family Medicine pipeline. Family Medicine Education Consortium, Danvers, MA 2011.

Seagrave MP, Anthony D, George PF, Leong SL, Chao J. Maximizing the benefits of virtual patient cases in real-life teaching and learning: The experience with fmCASES at three medical schools. Family Medicine Education Consortium, Danvers, MA 2011.

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George P, Dumenco L, Dollase R, Taylor JS, Wald H, Reis S. Introducing technology into medical education: two pilot studies. Accepted for publication in Patient Education and Counseling.

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