

Initial Match Rates of an Innovative International Partnership: The Ochsner Clinical School Experience

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Background: Ochsner Clinical School (OCS) is a unique partnership between Ochsner Health System in New Orleans, LA, and The University of Queensland (UQ) School of Medicine in Brisbane, Australia. OCS trains physicians in global medicine and promotes careers in primary care through its unique structure. The purpose of this study was to determine how OCS graduates perform in the National Resident Matching Program (NRMP)—The Match—compared to applicants from other types of medical schools.

Methods: The match outcomes for all OCS graduates since the first graduating class in November 2012 were compared to the match outcomes in the NRMP database for graduates from other types of medical schools in the years 2013-2015. We also examined the number of OCS students electing residencies in primary care compared to the number of US medical school graduates overall during the same time period of 2013-2015.

Results: The cumulative match rate from 2013-2015 for applicants from OCS was 91.8%. The OCS graduates' match rate was greater than the match rate for US citizen graduates of international medical schools during the same period (53.0% vs 91.8% [$z=6.066$, $P<0.0002$]), greater than the match rate for applicants from US osteopathic medical schools (77.3% vs 91.8% [$z=25.233$, $P<0.0002$]), and greater than the match rate for applicants from Canadian medical schools (62.7% vs 91.8% [$z=3.815$, $P<0.0002$]). The OCS match rate was not significantly different from that of US medical school graduates: 94.0% vs 91.8% ($z=-0.728$, $P=0.4666$). During the 2013-2015 time frame, 44.3% of OCS graduates chose residencies in primary care fields compared to 38.3% of US graduates ($z=-0.9634$, $P=0.337$).

Conclusion: Graduates of OCS are obtaining residency positions through The Match at rates comparable to those of US medical school graduates and at rates significantly greater than other groups, and we are seeing a trend in the number of graduates choosing careers in primary care.

Keywords: Education–medical–undergraduate, internship and residency, schools–medical, physicians–primary care

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INTRODUCTION

With the aging of the US population and expected physician retirements, the Association of American Medical Colleges (AAMC) projects a shortage of 46,000-90,000 physicians by 2025. Furthermore, with the changing health-care delivery system, primary care physicians are needed more than ever to manage populations and chronic diseases. The AAMC projects a 12,500-31,100 shortage of primary care physicians by 2025.¹ Innovative ways are needed to train more physicians—specifically primary care physicians.

Founded in 2008, the Ochsner Clinical School (OCS) is a unique medical school partnership between Ochsner Health System in New Orleans, LA, and The University of Queens-

land (UQ) School of Medicine in Brisbane, Australia. Students accepted into the program must be US citizens or permanent residents and have at least a bachelor's degree, a grade point average of 3.0, and a Medical College Admission Test score of 26. The US students join the traditional UQ medical school class for the first 2 years of their medical education in Brisbane, followed by 2 years at Ochsner Health System in New Orleans. After a gradual ramp up, OCS is now admitting its maximum capacity of 120 first-year students. The program aims to train physicians with an international perspective who will practice in United States. Another goal is to foster careers in primary care.

Along with learning the traditional biomedical sciences at UQ, students in the Ochsner cohort have access to a variety

of resources to help them prepare for the National Resident Matching Program (NRMP), commonly known as The Match. These resources include study plans and tutoring for the United States Medical Licensing Examination (USMLE) Step 1 and Step 2, mentorship programs, interviewing workshops, and career counseling.

The match rates for US citizen graduates of international medical schools have typically been significantly lower than the match rates for US citizen graduates of domestic schools. However, we did not know how the graduates of our unique international medical school program had performed in the NRMP compared to other categories of medical school graduates. Consequently, this observational study was designed to compare the outcomes of OCS students in The Match with the outcomes of other medical students.

METHODS

The database for all OCS graduates from the inception of the program included NRMP years 2013-2015. We analyzed the database information to determine the number of OCS students applying for The Match and the number of students matching in various residency programs. Our analysis also included the rate at which students matched into primary care residencies for NRMP years 2013-2015. Primary care residencies were defined as those in categorical medicine, pediatrics, medicine/pediatrics, and family medicine.

For comparison purposes, we extracted data from the NRMP database about other groups of students entering The Match: all US medical school graduates, US citizen graduates of international medical schools, Canadian medical school graduates, and US osteopathic medical school graduates.² Additionally, we determined the rate of all US graduates matching in primary care residencies from the NRMP database. We compiled cumulative data for these groups for NRMP years 2013-2015.

The variable of comparison was a binary variable, and we employed the 2-sample z test for proportions (chi-square test) to compare the rates between our OCS students and the NRMP data. For this test, the minimum sample size for

all the numbers in a cell is 5, and our samples met that requirement. Significance was defined as $P \leq 0.05$.

RESULTS

OCS graduated 3 classes of students ($n=61$) who entered The Match from 2013-2015. A total of 56 students successfully matched, for a cumulative match rate of 91.8% for applicants from OCS in the period 2013-2015 (Table 1). The OCS match rate exceeded the match rate of 53.0% ($z=6.066$, $P<0.0002$) for US citizen graduates of international medical schools during the same period. Likewise, the OCS match rate was greater than the 77.3% ($z=25.233$, $P<0.0002$) match rate for applicants from US osteopathic medical schools and the 62.7% ($z=3.815$, $P<0.0002$) match rate for applicants from Canadian medical schools (Figure 1). The OCS match rate was not significantly different from the 94.0% ($z=-0.728$, $P=0.4666$) rate for US medical school graduates.

Of the 61 OCS graduates, 27 (44.3%) chose residencies in primary care fields compared to 20,236/52,886 (38.3%) of US graduates choosing primary care fields ($z=-0.9634$, $P=0.337$) (Table 2). Primary care match rates for OCS graduates varied from 39.3% to 55.6% during the 2013-2015 time period (Figure 2). US primary care match rates remained at 38% during the same period.

DISCUSSION

Matching into American residency programs is becoming increasingly competitive, especially for international graduates.³ The OCS match rate of 91.8% is thus uniquely impressive among international programs, with no statistically significant difference compared to US medical school match rates.

The 5 most important factors in selecting applicants to interview for The Match as identified in the 2014 NRMP Program Director Survey were (1) USMLE Step 1 score, (2) letters of recommendation in the specialty, (3) Medical Student Performance Evaluation/Dean's Letter, (4) USMLE Step 2 Clinical Knowledge (CK) score, and (5) the personal statement.⁴ Other significant factors included graduation from a US allopathic medical school, grades in required clerkships, class ranking, leadership, and research experi-

Table 1. Match Rates for Various Medical Student Graduate Groups, 2013-2015

		2013	2014	2015	Cumulative Match Percentage
US medical school graduates	Total	17,487	17,374	18,025	
	Matched	16,390	16,399	16,932	94.0
US osteopathic medical school graduates	Total	2,677	2,738	2,949	
	Matched	2,002	2,127	2,339	77.3
Canadian medical school graduates	Total	21	14	24	
	Matched	14	6	17	62.7
US citizen graduates of international medical schools	Total	5,095	5,133	5,014	
	Matched	2,691	2,722	2,660	53.0
Ochsner Clinical School graduates	Total	9	24	28	
	Matched	9	22	25	91.8

US, United States.

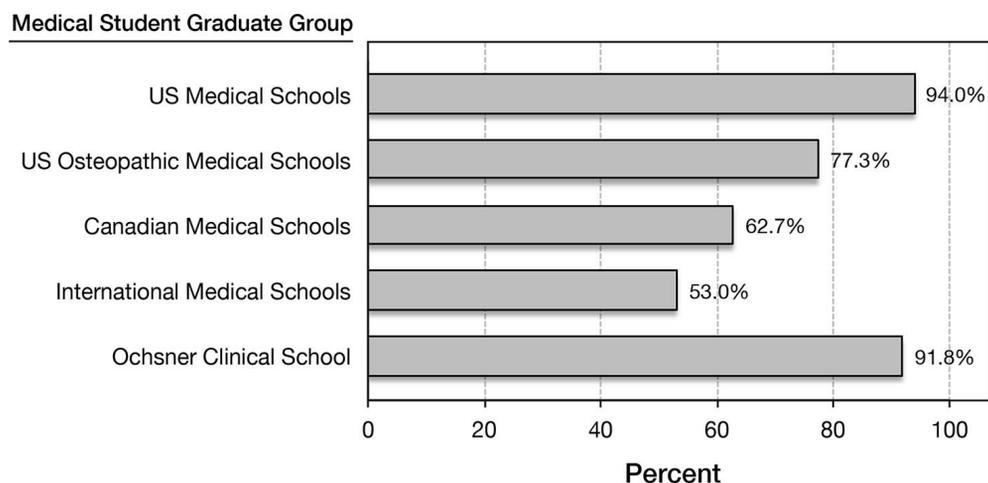


Figure 1. Overall match rates for various medical student graduate groups, 2013-2015.

ence. A key factor that increases the odds of a successful match is the number of programs the applicant ranks in his/her desired specialty.⁵ Applicants with longer rank order lists are more successful than those with shorter ones.

The second phase of a successful match is for applicants to be ranked highly by the residency programs on their rank order lists, which is largely influenced by the applicant's performance during the interview. The 5 most important factors cited by program directors in highly ranking applicants are (1) interactions with faculty on the interview and visit, (2) interpersonal skills, (3) interactions with house staff during the interview and visit, (4) feedback from current residents, and (5) USMLE Step 1 score.⁴ Overall, an applicant's USMLE Step 1 score is the single most important factor for preliminary screening, and the interview is the most important factor in determining the final selection.⁶

OCS facilitates students' successful performance in these criteria in a number of ways. The school provides extensive academic support for USMLE Step 1 and 2 preparations. During the first year of the program, all students receive a *Kaplan Medical USMLE Step 1 Qbook* and the current edition of *First Aid for the USMLE Step 1*.^{7,8} First-year students also receive tutorials from second-year students. In year 2, all students receive both Kaplan and UWorld Qbanks and 3 free National Board of Medical Examiners practice USMLE Step 1 examinations, 2 of which are

administered under exam-like conditions by the school.^{9,10} In the second year, students are tutored twice weekly by carefully selected upperclassmen who performed well on the USMLE Step 1 examination. This support has helped OCS students achieve a steady improvement in mean USMLE Step 1 scores. The current mean score for the OCS cohort is 227, on par with the 2014 overall USMLE Step 1 mean score of 229.¹¹ In the third year, students are provided a free 6-month subscription to the UWorld Step 2 CK Qbank.¹² Detailed study preparation plans are updated annually to reflect best practices in studying for the USMLE Step 1, Step 2 CK, and the Step 2 Clinical Skills examinations and provided to the students.

At the end of their third year, students have the opportunity to select the Optional Elective. The Optional Elective is a prime opportunity to work closely with and obtain a letter of recommendation from a faculty member at another institution or at Ochsner. Mentorship programs pair students with both a faculty member and a resident to provide career and academic advice. Formal seminars and workshops are held to inform students about successful match strategies, writing a CV and personal statement, obtaining letters of recommendation, and preparing for interviews. Mock interviews are held with faculty members who offer feedback on how students can hone their interviewing skills.

Table 2. Primary Care Match Rates for United States Medical School Graduates (US) and Ochsner Clinical School (OCS) Graduates, 2013-2015

	2013		2014		2015	
	US n=17,487	OCS n=9	US n=17,374	OCS n=24	US n=18,025	OCS n=28
Medicine	3,135	4	3,167	7	3,317	9
Pediatrics	1,837	0	1,818	1	1,889	1
Medicine/pediatrics	312	0	284	0	319	0
Family medicine	1,355	1	1,398	3	1,405	1
Total primary care matches	6,639	5	6,667	11	6,930	11
Total primary care match rate percentage	38.0	55.6	38.4	45.8	38.4	39.3

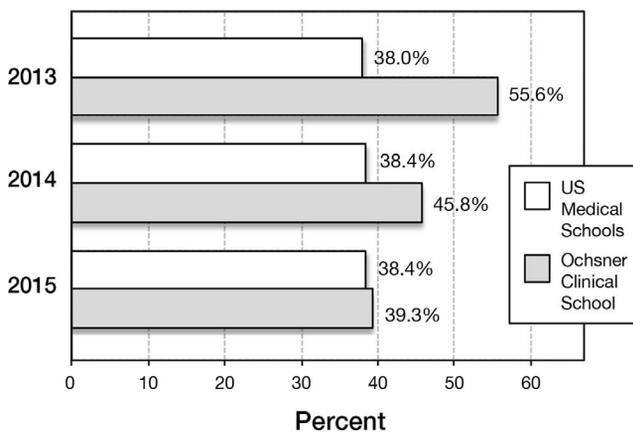


Figure 2. Primary care match rates for United States (US) medical school graduates and Ochsner Clinical School (OCS) graduates, 2013-2015.

Most international medical schools that train US students are for-profit businesses, but UQ and Ochsner Health System are both nonprofit institutions. UQ is accredited by the Australian Medical Council (AMC). The AMC has a robust accreditation process with ongoing monitoring to ensure high quality and continued improvements in education analogous to the role of the Liaison Committee on Medical Education that oversees medical education in the United States. Students develop the clinical skills to successfully practice in US training programs through learning at Ochsner Health System that has 23 graduate medical education residency programs. Additionally, students have ample access to research opportunities in Brisbane and in New Orleans. At the 2015 Ochsner Research Day, 22 OCS students coauthored abstracts, and 13 of those abstracts had an OCS student as the lead author. These many unique factors likely play a key role in the significantly higher match rates for OCS students compared to those of other US citizen graduates of international medical schools.

One of the school's primary missions is to train more primary care physicians. Family medicine residency positions filled by US medical school seniors decreased significantly from 1993 (63.2%) to 2014 (45.0%).¹³ Proposed reasons for this decline of interest in family medicine among US medical students are the lack of role modeling from faculty whose duties have increased and the lack of resident role models in many of the continuity clinics and nonteaching hospitalist services.¹³ In a poll of students, the Albert Einstein College of Medicine found that increased mentoring by family physicians early in their medical education was an important influence in selecting primary care residencies.¹⁴

In a metaanalysis from 1995, the strongest factor associated with careers in primary care was the number of weeks spent in family practice rotations. Other important factors included required family medicine rotations and a longitudinal experience in primary care.¹⁵ Students were also influenced by the institutional culture and strong role modeling in primary care.¹⁵ Student characteristics also play a large role in the decision to choose primary care. Some of these characteristics include an intent to practice primary care medicine, an interest in serving a rural or

disadvantaged population, and a positive perception of the primary care faculty's competence.^{16,17} Additionally, coming from a rural background correlated positively with a career choice of family medicine, while parents' socioeconomic status showed a negative correlation with this career path. Students who believe primary care is important, have low income expectations, and may not plan a research career are more likely to choose family medicine. Students who reject careers in family medicine are typically concerned about prestige, low income, and the breadth of knowledge required.^{16,17} Medical school debt was not an independent predictor of a primary care residency for a large sample of graduates from 3 medical schools in a study in which the mean total debt per student was \$89,807.¹⁸ Finally, an institution's culture seems to influence a student's choice of career. Institutions such as publicly funded schools that have a strong public service mission are associated with larger numbers of primary care graduates.¹⁵

OCS students matched into primary care residencies at a rate of 44.3% compared to graduates of US medical schools who matched into these fields at a rate of 38.3%. The comparison was not statistically significant, but as larger numbers of OCS students graduate and enter The Match, significant differences may emerge. We do not know how many of these students will remain in primary care fields as opposed to seeking subspecialty training.

OCS has a number of the characteristics that the literature predicts may result in students seeking careers in primary care. At OCS, students are exposed to a variety of primary care mentors both in the United States and in Australia. The Australian healthcare system is primary care driven and offers excellent role modeling in the effectiveness of general practice physicians in improving the health of a community. During the first 2 years in Australia, students participate in clinical coaching at local hospitals led by primary care physicians and gain exposure and mentorship early in their careers. During the second 2 years, students work with primary care physicians for at least 32 weeks during four 8-week blocks in general practice, internal medicine, pediatrics, and Medicine in Society (MIS). Supervised by primary care physicians, MIS is a community medicine rotation that exposes students to rural and underserved populations. In keeping with the study findings from the Albert Einstein College of Medicine, a preponderance of faculty and resident mentors in the OCS program are primary care physicians to provide strong role modeling in this field.¹⁴ Additionally, students have consistently rated the primary care rotations as the top rotations at OCS in student surveys since the inception of the program. Finally, because UQ and Ochsner Health System are nonprofit institutions, their missions emphasize the importance of patient care and service to the community.

CONCLUSION

OCS is an innovative partnership that offers American students the unique opportunity to gain a global experience in medicine and return to practice in the United States. OCS has match rates similar to those of US medical schools. Factors associated with these results may include the school's support of USMLE study preparation, mentorship programs, academic and career counseling, research

opportunities, and interview preparation workshops. These factors, along with the structure of the program that allows students to study at UQ for the first 2 years and then study at Ochsner for the second 2 years, may explain the significant difference in the OCS match rates compared to the match rates of other US citizen graduates of international medical schools. We have seen trends in graduates choosing careers in primary care, and the school will continue to support the factors that help promote this career pathway.

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REFERENCES

1. Association of American Medical Colleges. *The Complexities of Supply and Demand: Projections from 2013 to 2025*. https://www.aamc.org/download/426242/data/ihsreportdownload.pdf?cm_mmc=AAMC_-_ScientificAffairs_-_PDF_-_ihsreport. Accessed August 8, 2015.
2. National Resident Matching Program. Advance Data Tables: 2015 Main Residency Match. http://www.nrmp.org/wp-content/uploads/2015/03/ADT2015_final.pdf. Updated March 20, 2015. Accessed October 6, 2015.
3. Green M, Jones P, Thomas JX Jr. Selection criteria for residency: results of a national program directors survey. *Acad Med*. 2009 Mar;84(3):362-367.
4. National Resident Matching Program. *Results of the 2014 NRMP Program Director Survey*. June 2014. <http://nrmp.org/wp-content/uploads/2014/09/PD-Survey-Report-2014.pdf>. Accessed October 6, 2015.
5. National Resident Matching Program. *Charting Outcomes in the Match*. 5th ed. August 2014. <http://www.nrmp.org/wp-content/uploads/2014/09/Charting-Outcomes-2014-Final.pdf>. Accessed October 6, 2015.
6. Makdisi G, Takeuchi T, Rodriguez J, Rucinski J, Wise L. How we select our residents—a survey of selection criteria in general surgery residents. *J Surg Educ*. 2011 Jan-Feb;68(1):67-72. doi: 10.1016/j.jsurg.2010.10.003.
7. *Kaplan Medical USMLE Step 1 Qbook*. 6th ed. New York, NY: Kaplan Medical, Inc.; 2013.
8. Le T, Bhushan V. *First Aid for the USMLE Step 1 2014*. 24th ed. New York, NY: McGraw Hill Education; 2014.
9. UWorld USMLE Step 1 Qbank. https://www.uworld.com/step1/step1_qbank.aspx. Accessed October 6, 2015.
10. National Board of Medical Examiners. Comprehensive Self-Assessment Services. <http://www.nbme.org/students/sas/Comprehensive.html>. Accessed October 6, 2015.
11. United States Medical Licensing Exam. USMLE Score Interpretation Guidelines. http://www.usmle.org/pdfs/transcripts/USMLE_Step_Examination_Score_Interpretation_Guidelines.pdf. Updated August 24, 2015. Accessed October 6, 2015.
12. UWorld USMLE Step 2 CK Qbank. https://www.uworld.com/Step2CK/Step2CK_qbank.aspx. Accessed October 6, 2015.
13. Flannery MT. The 2014 United States National Residency Match Program data for primary care programs: a review. *Eur J Intern Med*. 2015 Jan;26(1):6-8. doi: 10.1016/j.ejim.2014.12.012.
14. Shapiro M, Fornari A. Factors influencing primary care residency selection among students at an urban private medical school. *Einstein J Biol Med*. 2010;25/26(1):19-24.
15. Bland CJ, Meurer LN, Maldonado G. Determinants of primary care specialty choice: a non-statistical meta-analysis of the literature. *Acad Med*. 1995 Jul;70(7):620-641.
16. Campos-Outcalt D, Senf J, Kutob R. A comparison of primary care graduates from schools with increasing production of family physicians to those from schools with decreasing production. *Fam Med*. 2004 Apr;36(4):260-264.
17. Senf JH, Campos-Outcalt D, Kutob R. Factors related to the choice of family medicine: a reassessment and literature review. *J Am Board Fam Pract*. 2003 Nov-Dec;16(6):502-512.
18. Kahn MJ, Markert RJ, Lopez FA, Specter S, Randall H, Krane NK. Is medical student choice of a primary care residency influenced by debt? *MedGenMed*. 2006 Oct 24;8(4):18.

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