

Comparing the Performance of Allopathically and Osteopathically Trained Physicians
on the American Board of Family Medicine's Certification Examination

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Two medical specialty boards offer certification in family medicine for physicians: the American Board of Family Medicine (ABFM), under the auspices of the American Board of Medical Specialties; and the American Osteopathic Board of Family Physicians (AOBFP), under the auspices of the American Osteopathic Association (AOA). The AOBFP certification is offered only to graduates of osteopathic colleges; however, graduates of both osteopathic and allopathic medical schools who have successfully completed a residency program accredited by the Accreditation Council for Graduate Medical Education (ACGME) may seek certification by the ABFM. Some allopathic family medicine residency programs are accredited by both the ACGME and the AOA, which qualifies their residents to seek certification from either or both certification boards. Such programs are referred to as having “dual accreditation.”

The performance of the following are addressed herein: (1) first-time candidates on the ABFM certification examination, (2) candidates from allopathic and osteopathic colleges, and (3) candidates from allopathic and osteopathic colleges who completed dually accredited residency programs. Issues of attrition are also addressed.

Method

This study used a natural groups design with a matching variable in some cases to test for differences in performance on the ABFM certification examination between osteopathically and allopathically trained physicians.

Participants

The participants in this study were first-time candidates for ABFM certification who tested in 2007 and 2008. Only a candidate's first attempt on the examination was considered. All

of these candidates graduated from a college of medicine, held an unrestricted U.S. medical license, and successfully completed an ACGME accredited residency program. A subset of this cohort consisted only of the candidates who successfully completed a residency program that was accredited by both ACGME and AOA.

Instrument

The instrument employed in this study was the ABFM's Certification Examination. This examination consisted of 370 multiple choice items that are dichotomously scored. However, 20 of the items are pretest items, resulting in 350 items that contributed to the candidate's score. The test was designed in accordance with the test blueprint.¹ Additional information about the test can be found in the Candidate Information Booklet.² Scoring of the test was performed using the dichotomous one parameter logistic (1PL) model, also known as the Rasch measurement model.³

Analysis

MD/DO Comparison.

Using an independent samples t-test, the scaled scores for MDs and DOs were compared twice, first considering the entire cohort and second considering only the subset from the dually accredited programs. Pass rates for these groups were then compared using an independent samples test for differences between the two percentages. The calculation of the standard error of the pass rate was defined as:

$$s_p = \sqrt{\frac{pq}{N}}$$

where,

- s_p = the standard error of the proportion
- p = pass rate
- q = $1-p$
- N = sample size

The following formula was used to transform the difference between the percentages into a z-score:

$$z = \frac{p_{MD} - p_{DO}}{\sqrt{\frac{s^2_{p_{MD}}}{n_{MD}} + \frac{s^2_{p_{DO}}}{n_{DO}}}}$$

where,

- z = the standardized z score
- p_{MD} = the pass rate for MDs
- p_{DO} = the pass rate for DOs
- $s^2_{p_{MD}}$ = the variance for the MD pass rate
- $s^2_{p_{DO}}$ = the variance for the DO pass rate

Delay and Attrition.

To determine any decline in the number of eligible residents taking the certification examination after Program Year 3 (PGY3), counts were provided for the same cohort beginning in 2004 and ending in 2007, as residents progressed through their residency as indicated by Program Year 1 (PGY1), Program Year 2 (PGY2), PGY3, and finally those taking the certification exam in 2007. The average number of candidates at each point in time was determined and compared.

Results

MD and DO Performance Comparisons on the ABFM Examination

In 2007 and 2008 respectively, there were 3,329 and 3,111 first-time candidates attempting to earn their initial certification (Table 1). Most of the candidates (86% and 87% respectively) were MDs, with the remainder being DOs.

In 2007, MDs had a greater propensity to pass ($M = 79.8\%$, $SE_{Pass\ Rate} = 0.0075$) than DOs ($M = 74.6\%$, $SE_{Pass\ Rate} = 0.0202$), and a difference of this magnitude is unlikely to have occurred by chance, $t(599.3) = -2.38, p < .018$. In 2008, MDs ($M = 83.8\%$, $SD = 32.2$) and DOs

($M = 83.2\%$, $SD = 33.1$) had pass rates that were not significantly different, $t(1944) = 0.38$, $p < .708$.

The mean scaled scores for these groups were computed and subsequently tested for statistically significant differences. The unequal variance formula for t-tests was employed because Levene's test for homogeneity of variance yielded a significant difference between the variances of the MD and DO groups. For 2007, $F(1,3327) = 7.72$, $p < .005$; for 2008, $F(1,3109) = 5.17$, $p < .023$. In 2007, MDs scored higher ($M = 457.6$, $SD = 85.4$) than DOs ($M = 437.6$, $SD = 78.7$) and a difference of this magnitude is unlikely to have occurred by chance, $t(654.5) = 5.02$, $p < .001$. In 2008, MDs again scored higher ($M = 473.1$, $SD = 85.7$) than DOs ($M = 459.8$, $SD = 78.9$) and a difference of this magnitude is also unlikely to have occurred by chance, $t(536.7) = 3.077$, $p < .002$.

TABLE 1. Summary of Performance by ABFM Candidates for Initial Certification in 2007 and 2008

| | 2007 | | 2008 | |
|------------|--------|--------|--------|--------|
| | MD | DO | MD | DO |
| Count | 2864 | 465 | 2717 | 394 |
| Passing | 2284 | 347 | 2277 | 328 |
| Pass Rate | *79.7% | *74.6% | 83.8% | 83.2% |
| Mean Score | *457.6 | *437.6 | *473.1 | *459.8 |

*Indicates that there was a statistically significant difference between MDs and DOs at the $\alpha < .05$ level.

Dually Accredited Programs

According to the American Osteopathic Association, as of 2009, 91 residency programs were accredited by both the ACGME and the AOA.⁴ Of these 91 programs, only 86 had valid ACGME Program ID numbers listed on the AOA Website. The five programs without ACGME ID numbers were excluded from this study.

The following analysis was based on the scores of candidates who completed a dually accredited residency program. It should be noted that only candidates' first attempt on the initial certification examination were included. Therefore, candidates who had previously failed or who were testing to become recertified were excluded from the analysis.

MD and DO Comparisons among Dually Accredited Programs on the ABFM Examination

With regard to whether the MDs or the DOs from dually accredited programs had a greater propensity to pass, the results were mixed (Table 2). In 2007, MDs ($M = 77.4\%$, $SE_{Pass\ Rate} = 0.0188$) passed at a higher rate than DOs ($M = 72.7\%$, $SE_{Pass\ Rate} = 0.0475$); although, the results were not statistically significant, $t(582) = -0.96$, $p < .338$. Similarly, the difference in mean scaled scores between MDs ($M = 450.2$, $SD = 81.7$) and DOs ($M = 448.5$, $SD = 87.7$) was small and well within boundaries of random variation, $t(582) = -0.18$, $p < .857$. In 2008, DOs ($M = 84.6\%$, $SD = 33.5$) slightly outperformed MDs ($M = 83.9\%$, $SD = 33.2$) with regard to pass rates, but MDs ($M = 472.0$, $SD = 84.7$) attained higher mean scaled scores than DOs ($M = 461.8$, $SD = 77.4$). This is likely due to the effects of a small sample of DOs ($n = 65$) compared to a larger and more densely populated distribution of MDs ($n = 453$). The difference in mean scaled scores between MDs and DOs, however, was small and within boundaries of random variation, $t(317) = 1.83$, $p < 0.068$, so it is likely these results occurred by chance.

TABLE 2. Summary of Performance by ABFM Candidates from Dually Accredited Residency Programs for Initial Certification in 2007 and 2008

| | 2007 | | 2008 | |
|------------|-------|-------|-------|-------|
| | MD | DO | MD | DO |
| Count | 496 | 88 | 453 | 65 |
| Passing | 384 | 64 | 380 | 55 |
| Pass Rate | 77.4% | 72.7% | 83.9% | 84.6% |
| Mean Score | 450.2 | 448.5 | 472.0 | 461.8 |

*There were no statistically significant difference between MD and DO cohorts at the $\alpha < .05$ level.

Delay and Attrition

It is reasonable to assume that the directors of the dually accredited residency program want all of their program's residents to both sit for and pass the ABFM certification examination. However, some DOs may decide to forego ABFM certification in favor of osteopathic certification, which raises this question: "Among dually accredited programs, is there a sizeable cohort of DOs that complete the residency training, but that do not apply for ABFM certification the following year?"

To investigate this question, the records for the dually accredited programs were queried from ABFM's Resident Training Management System (RTMS) to identify the number of residents from each of the programs that took the residents' In-Training Examination (ITE). It is believed that nearly all program directors require their residents, regardless of the type of medical school they attended, to take the ITE. Therefore, the difference between the mean number of candidates taking the ITE and the mean number of first-time candidates taking the examination the following year should be a good indicator of how many residents typically opt not to take the examination. The results suggest that the average program has 7 residents but only 6 who sit for the examination (Figure 1).

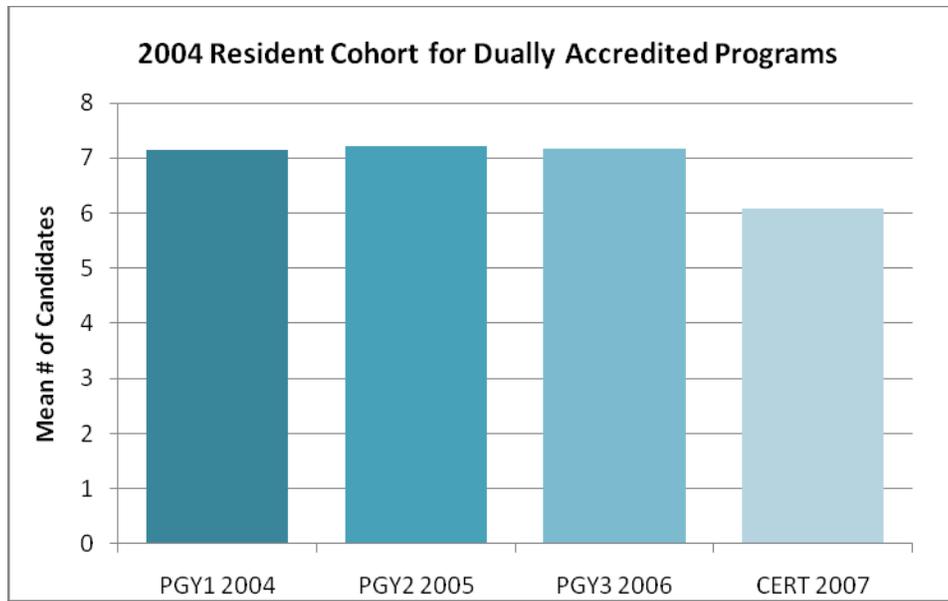


FIGURE 1. Mean number of residents taking the ITE and ABFM certification examinations.

An investigation into resident enrollment and attrition among various programs from the PGY3 to the 2007 Certification year reveals interesting findings. Figure 2 displays the frequency distribution of these change rates. Programs with no changes ($n = 22$) are the most prevalent, but programs that lost 1 ($n = 21$) or 2 ($n = 17$) residents closely follow. Twelve programs lost 3 or more residents during this timeframe, while 11 programs actually reported gaining 1 to 2 residents. It is likely the instances of increase are attributable to residents who were eligible to complete the examination in 2006, but opted to postpone the initial attempt at the examination until the following year.

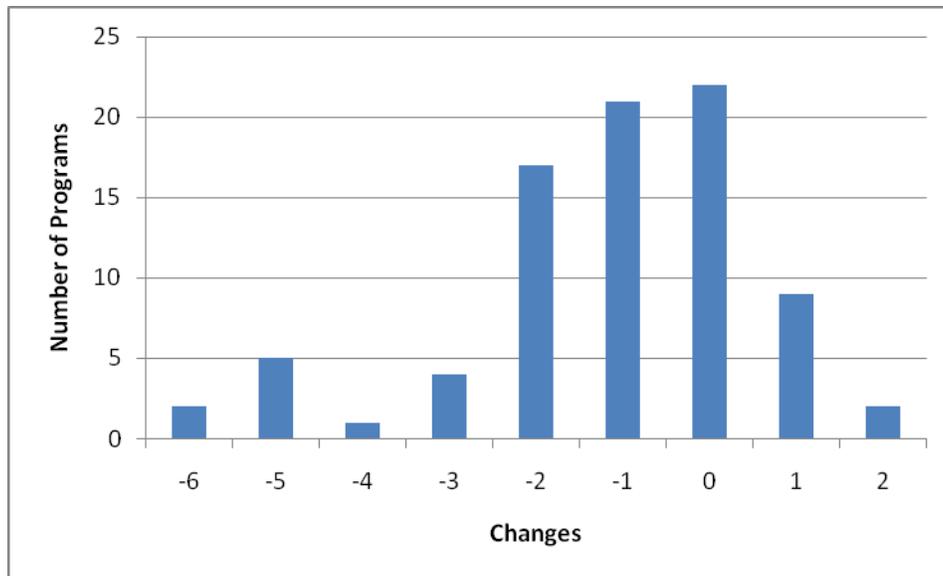


FIGURE 2. Difference between 2006 PGY3 residents and 2007 ABFM examinees.

Discussion

Issues of Comparison

There are at least two factors that make the MD and DO performance comparison less clear: selection bias and comparability of constructs. Because there are two medical specialty boards that offer certification in family medicine, only DOs have the option of pursuing either or both AOBFP and ABFM certifications. Because MDs cannot obtain AOBFP certification, any comparative analyses between examinees' successes and failures with regard to the two certification boards' examinations are limited for dominantly two methodological reasons. The first pertains to the aforementioned problem of true comparative data, as one cannot observe performance on matched cohorts because MDs cannot sit for the AOBFP examination. The second pertains to the issue of comparability between constructs. Ideally, one would need to know if these tests generally measure the same construct. Assessing the comparability of the

construct is largely a content-related endeavor, and we are unaware of any literature that addresses ABFM and AOBFP examination similarities or dissimilarities.

Bias in Selecting a Program

Among medical graduates there are noticeable individual differences in ability. Similarly, there are differences in the quality of residency programs as perceived by the pool of new residents. Therefore, medical graduates span a continuum of ability and residency programs span a range of quality. If residents seek to get into the best program that will accept them and residency programs accept only the best applicants to their program, then there is likely to be a positive correlation between the quality of resident and the quality of the program. This may cause differences in examination performance between MD and DO cohorts to be smaller when only the dually accredited programs are considered, because the quality of the programs are held constant.

Sources of Attrition

On average, there were approximately 7 persons enrolled in each dually accredited PGY3 cohort in 2006. The average number of candidates from these cohorts who elected to take the ABFM certification exam was approximately 6. These data indicate about 1 person per program within the cohort opts not to sit for the ABFM certification examination each year.

In 2008, the number of DOs seeking ABFM initial certification ($n = 394$) decreased by 71 from the 2007 year ($n = 465$). The number of DO residents from dually accredited residency programs seeking ABFM initial certification also dropped from 88 to 65 during the 2007 and 2008 years, a decrease of 23. Analyses of these data consistently suggest a small number of residents, some of whom are from dually accredited programs, do not seek ABFM certification.

In 2006, there was no unique common identifier used to connect a candidate's residency records to his or her records related to certification. Because the demographic information is largely part of the candidate records, identifying the demographics for people who did not test is not possible. Because of this limitation the analyses did not explore the demographics related to medical training, MD and DO, therefore it is unclear whether the missing cases consist of MDs, DOs, or both. Also, the inability to differentiate between actual instances of attrition and mere deferrals to taking test further limits this study. Given there is some degree of attrition or deferral, the authors provide several plausible reasons why residents might not have taken the ABFM's Certification Examination.

First, the resident may have taken a job in another city or state and the idea of taking on a new job, moving, and preparing for the ABFM examination may seem to be too much to take on all at once. These physicians may have decided to delay taking the examination. Other plausible reasons for delaying taking the examination could include having a child, dealing with a serious illness, or resolving a family crisis.

Second, some residents may have opted to become exclusively ABOFP certified. There are several reasons for why they might make this choice. One is that AOA requires 90% of residents within their accredited residency programs to take the ABOFP examination, which has a very high pass rate and the test results are available before the deadline to apply for the ABFM examination.⁵ Some residents may consider the additional certification to be too time consuming and expensive to pursue.

Summary

When comparing the performance of residents from ACGME accredited family medicine residency programs on the ABFM's Certification Examination, there is a statistically significant

difference between residents who graduated from allopathic medical schools and osteopathic medical schools. With regard to the scaled scores, the allopathically trained physicians outperformed the osteopathically trained physicians by 13 to 20 points. Although this difference was larger than what could be attributed to chance, it did not always translate to a difference in pass rate that was statistically significant. After controlling for differences in the quality and selectivity of the residency programs by considering only the dually accredited residency programs, the statistical differences vanished. The data also suggested that for the dually accredited programs the average class size was 7 residents, but only 6 take the test the following year. It was unclear how much of this decrease was attrition and how much was a delay in testing.

References

1. American Board of Family Medicine. Certification/Recertification Examination Content. American Board of Family Medicine, <https://www.theabfm.org/cert/CertRecertExaminationOutline.pdf>, accessed June 17, 2009.
2. American Board of Family Medicine. Candidate Information Booklet. American Board of Family Medicine, <https://www.theabfm.org/cert/candidateinfobooklets.aspx>, accessed June 17, 2009.
3. Rasch G. *Probabilistic models for some intelligence and attainment tests*. Copenhagen, 1960.
4. American Osteopathic Association. Welcome to Opportunities—AOA-Approved Internships and Residencies. American Osteopathic Association, <http://opportunities.osteopathic.org/search/search.cfm>, accessed June 15, 2009.
5. Terry R. Dual Accreditation: Certification Reality. Presentation for Wilson Memorial Hospital, <http://www.do-online.org/pdf/2009OME-PPT/Terry%20-%20Dual%20programs%202009.ppt>, accessed June 16, 2009.

APPENDIX A. Residency Programs that are Accredited by Both ACGME and AOA.

| SEQ | AOA# | ACGME# | State | Family Practice/Family Medicine Residency Program |
|-----|--------|------------|-------|--|
| 01 | 183204 | 1200221596 | AK | PCSOM/Alaska Family Medicine Residency Providence–Family Practice Residency |
| 02 | 126035 | 1200411037 | CA | WesternU/COMP Arrowhead Regional Medical Center |
| 03 | 136635 | 1200411037 | AR | OSUCOM/UAMS-AHEC |
| 04 | 130876 | 1200911079 | DE | PCOM/Christiana Care Health Services |
| 05 | 169601 | 1201111085 | FL | NSUCOM/St Vincents Medical Center |
| 06 | 169593 | 1201211092 | GA | NSUCOM/The Medical Center |
| 07 | 163815 | 1201221091 | GA | NSUCOM/Medical College of GA |
| 08 | 180852 | 1201231094 | GA | NSUCOM/Floyd Medical Center |
| 09 | 148262 | 1201611098 | IL | MWU/CCOM/MacNeal Hospital |
| 10 | 161923 | 1201611099 | IL | KCOM/SIU/Memorial Hospital of Carbondale |
| 11 | 169600 | 1201611102 | IL | Resurrection Medical Center |
| 12 | 183228 | 1201611110 | IL | MWU/CCOM/Adventist LaGrange Memorial Hosp |
| 13 | 183232 | 1201621109 | IL | MWU/CCOM/Adventist Hinsdale Hospital |
| 14 | 158101 | 1201621117 | IL | KCOM/Center Family Med/SIU Springfield Family Med |
| 15 | 148258 | 1201621365 | IL | KCOM/SIU/Quincy |
| 16 | 173196 | 1201621467 | IL | MWU/CCOM/Illinois Masonic Medical Ctr |
| 17 | 158102 | 1201621492 | IL | MWU/CCOM/Carle Foundation Hospital |
| 18 | 163821 | 1201631106 | IL | MWU/CCOM/Swedish Covenant Hospital |
| 19 | 163823 | 1201631112 | IL | MWU/CCOM/West Suburban Hospital Medical Center |
| 20 | 180854 | 1201721121 | IN | PCSOM/Fort Wayne Medical Ed Program |
| 21 | 156882 | 1201921630 | KS | Via Christi Regional Medical Center/Riverside |
| 22 | 173195 | 1202021512 | KY | PCSOM/East Kentucky Osteo Hosp |
| 23 | 169592 | 1202211153 | ME | UNECOM/Central Maine Medical Center |
| 24 | 148265 | 1202212152 | ME | UNECOM/Eastern Maine Med Ctr |
| 25 | 158105 | 1202222151 | ME | UNECOM/Maine—Dartmouth Family Practice Program |
| 26 | 152962 | 1202431159 | MA | UNECOM/University MA (Fitchburg) Family Practice Program |
| 27 | 162368 | 1202521169 | MI | MSUCOM/Kalamazoo Ctr Med Studies |
| 28 | 182443 | 1202521170 | MI | EW Sparrow Hospital |
| 29 | 169598 | 1202521370 | MI | LECOM/Marquette General Health System |
| 30 | 126081 | 1202521602 | MI | MSUCOM/Munson Medical Center |
| 31 | 128268 | 1202531166 | MI | Genesys Regional Med Ctr-Health Park |
| 32 | 182483 | 1202531678 | MI | MSUCOM/Oakwood Annapolis Hospital |
| 33 | 181016 | 1202621568 | MN | KCOM/U of Minnesota Mankato |
| 34 | 176243 | 1203311195 | NJ | KCOM/AHS Overlook Hospital |
| 35 | 126317 | 1203321436 | NJ | PCOM/Warren Hospital Div |
| 36 | 137585 | 1203421197 | NM | TUCOM/University of New Mexico Hospital |

| | | | | |
|----|--------|------------|----|--|
| 37 | 130094 | 1203511203 | NY | Wilson Memorial Reg Med Ctr |
| 38 | 126103 | 1203511206 | NY | NYCOM/Jamaica Hospital Div |
| 39 | 126088 | 1203511207 | NY | NYCOM/Lutheran Medical Hosp |
| 40 | 182452 | 1203511212 | NY | NYCOM/South Nassau Communities Hosp |
| 41 | 148266 | 1203511217 | NY | UNECOM/St Elizabeth's Hospital |
| 42 | 180855 | 1203512215 | NY | NYCOM/Ellis Hospital McClellan Campus |
| 43 | 169591 | 1203521198 | NY | UNECOM/Albany Medical College |
| 44 | 126107 | 1203521204 | NY | NYCOM/The Institute for Family Health |
| 45 | 129226 | 1203521507 | NY | NYCOM/Wyckoff Heights Medical Center |
| 46 | 128304 | 1203531681 | NJ | St Joseph's Hospital & Med Ctr |
| 47 | 169929 | 1203621611 | NC | PCSOM/New Hanover Regional Med. Ctr |
| 48 | 167087 | 1203631223 | NC | NSUCOM/Duke/Southern Regional Area Health Ed Ctr |
| 49 | 173208 | 1203811234 | OH | LECOM/Aultman Hospital |
| 50 | 169831 | 1203811237 | OH | OUCOM/Metro-Health Medical Center |
| 51 | 175833 | 1203821231 | OH | OUCOM/SUMMA/Akron City Hospital |
| 52 | 157345 | 1203821250 | OH | WVSOM/The Toledo Hospital |
| 53 | 126197 | 1203831249 | OH | OUCOM/St Vincent Mercy MC |
| 54 | 152357 | 1203921513 | OK | OSUCOM/St Anthony Hospital |
| 55 | 126651 | 1204111260 | PA | Altoona Hospital |
| 56 | 162367 | 1204111269 | PA | LECOM/Conemaugh Valley Memorial Hosp |
| 57 | 173201 | 1204111277 | PA | PCOM/Latrobe Area Hospital |
| 58 | 163816 | 1204111578 | PA | Mercy Hospital (Pittsburgh) |
| 59 | 169603 | 1204112271 | PA | LECOM/UPMC McKeesport |
| 60 | 169604 | 1204112279 | PA | LECOM/UPMC St Margaret Memorial Hospital |
| 61 | 173203 | 1204112280 | PA | PCOM/UPMC/Shadyside Hospital |
| 62 | 183210 | 1204112283 | PA | LECOM/Washington Hospital |
| 63 | 148259 | 1204112579 | PA | LECOM/Western Pennsylvania Hospital |
| 64 | 176235 | 1204121259 | PA | PCOM/Sacred Heart Hospital |
| 65 | 158104 | 1204121284 | PA | PCOM/Wyoming Valley Health Care |
| 66 | 156883 | 1204121518 | PA | LECOM MedNet/Guthrie/Robert Packer Hospital |
| 67 | 169595 | 1204121572 | PA | PCOM/Lehigh Valley Hosp Health Network |
| 68 | 157428 | 1204121603 | PA | PCOM/St. Luke's Hospital |
| 69 | 169599 | 1204124109 | PA | PCOM/The Medical Center Beaver PA |
| 70 | 176183 | 1204131261 | PA | Bryn Mawr Hospital |
| 71 | 180856 | 1204131285 | PA | PCOM/Williamsport Hospital/Med Ctr |
| 72 | 169602 | 1204511293 | SC | PCSOM/Spartanburg Regional Health Systems |
| 73 | 180851 | 1204821305 | TX | Univ TX Medical Branch - Galveston - Family Practice |
| 74 | 173200 | 1204821310 | TX | TCOM/Texas Tech Univ Hlth Sci Ctr |
| 75 | 175836 | 1204821432 | TX | UNTHSC/TCOM/San Jacinto Methodist Hospital |
| 76 | 163817 | 1204821433 | TX | UNTHSC/TCOM/Charlton Methodist Hospital |

| | | | | |
|----|--------|------------|----|--|
| 77 | 152127 | 1205111325 | VA | EVVCOM/Carilion Medical Center |
| 78 | 167091 | 1205121627 | VA | PCSOM/Shenandoah Valley Hospital |
| 79 | 173194 | 1205131323 | VA | PCSOM/Riverside Regional Medical Ctr |
| 80 | 182473 | 1205421522 | WA | PCSOM/Central WA Family Medicine Residency Program |
| 81 | 152124 | 1205511337 | WV | WVSOM/Charleston Area Med Ctr |
| 82 | 175834 | 1205521335 | WV | WVSOM/Cabell Huntington Hospital |
| 83 | 126330 | 1205522334 | WV | WVSOM/United Hospital Center |
| 84 | 162372 | 1205522338 | WV | WVSOM/Wheeling Hospital |
| 85 | 152130 | 1205611343 | WI | DMU/University of WI Med School |
| 86 | 169589 | 1205712351 | WY | KCOM/University of Wyoming |