Title

Is Training in a Primary Care Internal Medicine Residency Associated with a Career in Primary Care Medicine?

Journal

Journal of general internal medicine, 30(9)

ISSN

0884-8734

Authors

Stanley, Marion
O'Brien, Bridget
Julian, Katherine
et al.

Publication Date

2015-09-01

DOI

10.1007/s11606-015-3356-9

Peer reviewed

Is Training in a Primary Care Internal Medicine Residency Associated with a Career in Primary Care Medicine?

Marion Stanley, MD[1], Bridget O'Brien, PhD[2], Katherine Julian, MD[2], Sharad Jain, MD[2], Patricia Cornett, MD[2], Harry Hollander, MD[2], Robert B. Baron, MD, MS[2], and R. Jeffrey Kohlwes, MD, MPH[2,3]

[1]Northwestern Memorial Hospital, Chicago, IL, USA; [2]University of California, San Francisco, CA, USA; [3]University of California, Veterans' Affairs Medical Center, San Francisco, CA, USA.

PURPOSE: Professional and governmental organizations recommend an ideal US physician workforce composed of at least 40 % primary care physicians. They also support primary care residencies to promote careers in primary care. Our study examines the relationship between graduation from a primary care or categorical internal medicine residency program and subsequent career choice.

METHODS: We conducted a cross-sectional electronic survey of a cohort of internal medicine residency alumni who graduated between 2001 and 2010 from a large academic center. Our primary predictor was graduation from a primary care versus a categorical internal medicine program and our primary outcome is current career role. We performed chi-square analysis comparing responses of primary care and categorical residents.

RESULTS: We contacted 481 out of 513 alumni, of whom 322 responded (67 %). We compared 106 responses from primary care alumni to 169 responses from categorical alumni. Fifty-four percent of primary care alumni agreed that the majority of their current clinical work is in outpatient primary care vs. 20 % of categorical alumni ($p<0.001$). While 92.5 % of primary-care alumni were interested in a primary care career prior to residency, only 63 % remained interested after residency. Thirty of the 34 primary care alumni (88 %) who lost interest in a primary care career during residency agreed that their ambulatory experience during residency influenced their subsequent career choice.

CONCLUSIONS: A higher percentage of primary care alumni practice outpatient primary care as compared to categorical alumni. Some alumni lost interest in primary care during residency. The outpatient clinic experience may impact interest in primary care.

KEY WORDS: primary care; medical education-career choice; medical education-outcomes research; workforce.

J Gen Intern Med 30(9):1333–8

DOI: 10.1007/s11606-015-3356-9

Electronic supplementary material *The online version of this article (doi:10.1007/s11606-015-3356-9) contains supplementary material, which is available to authorized users.*

Published online July 15, 2015

INTRODUCTION

Primary care is an integral part of patient care, emphasizing prevention, screening, and maintenance of well-being. Communities served by primary care physicians (PCPs) are linked to overall improved health.[1,2] Concerns exist, however, about an increasing shortage of adult PCPs to care for an aging population.[3–5] Fewer physicians now enter into outpatient primary care,[6] and there is a looming attrition rate of PCPs, with almost one-quarter of practicing PCPs in 2011 being 56 years of age or older.[7] Current strategies to address the primary care shortage include payment structure reform,[8,9] implementation of team-based primary care with patient centered medical homes,[10,11] as well as increasing the number of primary care based graduate medical education residency positions.[12,13]

Many internal medicine residency programs have emphasized ambulatory medicine by creating primary care tracks that are designed to highlight outpatient medicine. Professional and governmental organizations, including the Health Resources and Services Administration (HRSA) and the Council on Graduate Medical Education (COGME), endorse and support primary care residency programs in order to help promote a workforce that consists of at least 40 % outpatient primary care physicians as compared to the 2010 level of 32 %.[7]

While several studies have examined which aspects of medical school curricula might pique medical students' interest in primary care careers,[14–16] the effect of primary care curricula in residency training on resident career choice is less well documented. Recent studies of primary care programs reveal that participation in a primary care track significantly increased intent to practice primary care at graduation from residency, but importantly, these cohorts were not followed into practice to determine whether stated career choices persisted.[17,18] Other studies evaluating small primary care tracks focused on training PCPs for underserved patient populations have demonstrated that the majority of these individuals pursue a primary care career. These studies, however, lacked comparison groups.[19,20]

Given the limitations of existing data, the effectiveness of primary care residencies in supporting an outpatient generalist

career choice compared to categorical programs remains uncertain. Our study examines whether participation in a primary care internal medicine residency is associated with a subsequent career in outpatient primary care amongst 10 years of graduates from the University of California, San Francisco (UCSF) primary care residency cohort compared to their categorical colleagues.

METHODS

Design

We used survey data to perform a cross-sectional study comparing the careers of primary care and categorical alumni from the UCSF internal medicine residency program between 2001 and 2010. After 2010, there was widespread implementation of a pathways to discovery program, which enabled residents to participate in immersion curricula in various areas, including international health, health systems leadership, medical education, and underserved medicine, as well as the already existing pathways of molecular medicine and clinical outcomes research. We consequently chose to study the years before 2011 when all categorical residents at UCSF received an internal medicine curriculum that emphasized clinical skills and academic development without the addition of a focused area of specialty interest.

Setting and Participants

The UCSF internal medicine residency program includes a traditional categorical program, two primary care residencies, and a focused research track in Molecular Medicine. Each program has a separate match number, and residents choose between these tracks based on their training preference. The UCSF Primary Care General Internal Medicine track (UCPC) is designed to develop leaders in general medicine through dedicated training in ambulatory medicine. The UCSF San Francisco General Primary Care track (SFPC) trains PCPs who will care for urban underserved patient populations. Lastly, the Molecular Medicine program is primarily composed of MD-PhD bench researchers who ultimately fast-track into basic science research careers.

From 2001–2010, 513 residents graduated from the UCSF internal medicine residency program, of which 137 completed UCPC, 55 completed SFPC, and 321 completed the categorical program. All alumni included in this analysis were American medical school graduates.

Procedures

We collected residency alumni email addresses through direct contact, social media, professional websites and word of mouth, then surveyed 481 alumni whose contact information we acquired. A senior faculty member (JK) emailed alumni a personal link to a 27-question survey using Qualtrics software, a web-based survey program. We emailed our survey weekly for three consecutive weeks in February 2013 or in September 2013, depending on when alumni contact information was obtained. All alumni received identical emails and follow-up communication. Participation in the survey was voluntary. Responses were de-identified for analysis. This study received approval from the UCSF human subjects institutional review board and the San Francisco Veterans Affairs Research and Development Committee.

We developed our survey based on a review of previously utilized residency alumni surveys, input from residency faculty and local survey experts, feedback from current residents, and input from senior advisors from the UCSF Academy of Medical Educators. The survey was then piloted at two separate residency research "work-in-progress" sessions with non-participants to ensure question clarity. This survey was nested within a larger questionnaire examining alumni careers, mentorship, scholarship and interest in underserved medicine.

Alumni were asked to provide demographic information such as age, gender, race/ethnicity, as well as the training program each alumnus participated in during residency, namely, categorical, primary care, or Molecular Medicine. Alumni were also asked to report whether the majority of their current clinical work is in outpatient primary care, to state their interest in an outpatient primary care career pre-residency and post-residency, and to identify whether the ambulatory experience during residency influenced career choice (Appendix 1 *available online*). All items were rated on a five-point Likert scale (1=strongly disagree to 5=strongly agree).

Analysis

We used training program, namely, categorical versus primary care, as our primary predictor variable. Primary care residents were defined as graduates from UCPC or SFPC programs, while categorical residents were defined as all other respondents. Our primary outcome variable was whether the majority of a respondent's current clinical work is in outpatient primary care. Responses were dichotomized such that alumni who answered "strongly agree" and "agree" were characterized as having a current career in primary care, while alumni who answered "strongly disagree," "disagree," and "neutral" were characterized as not having a current clinical career in primary care. Secondary outcome variables included change of interest in a primary care career during residency, and whether the ambulatory medicine experience during residency influenced career choice. Secondary outcome responses were similarly dichotomized.

We ran descriptive statistics for all variables and performed Chi-Square analysis to compare the career outcomes of primary care and categorical alumni. We did not run multivariate analysis due to small sample size, but we used a Bonferroni correction (alpha=0.0125) to account for multiple comparisons. We used SPSS version 21 for all analyses.

RESULTS

Of the 481 alumni emailed, 322 alumni responded to our survey for a 67 % response rate. A slightly higher percentage of responses were from categorical alumni with a 70 % response rate as compared to a 64 % response rate from primary care graduates. From the 322 respondents, we excluded 42 graduates who self-identified as current fellows, as they had not yet started their faculty careers and we could not be sure of their final practice type. We also excluded the five graduates from the Molecular Medicine residency, as their research-oriented training made them poor candidates for our control group. Six graduates completed the survey twice, and of those, we analyzed only the first completed survey. For this analysis, 275 participants were included in order to compare 106 responses from former primary care residents to 169 responses from former categorical residents. Two of the respondents did not answer all questions, resulting in numbers less than 275 in the denominator for some questions. Graduates from the categorical and primary care programs were similar with respect to year of graduation, age, and race/ethnicity. A higher percentage of the primary care alumni are female (Table 1). The two primary care residencies were similar demographically, except the UCPC cohort had a slightly higher percentage of Caucasians and Asian-Indians while the SFPC cohort had a slightly higher percentage of Asian-Other. We conducted a regression analysis across the years of graduation comparing primary care and categorical residents for their subsequent career choice and found the slope of the line across the years to be essentially 0 for both groups. These findings suggest no effect of time on the outcomes of interest.

Our primary outcome revealed that 57/106 (54 %) of graduates from the primary care track agreed that the majority of their current clinical work is in outpatient primary care medicine as compared to 34/160 (20 %) of categorical residency graduates; $p<0.001$. The difference in subsequent primary care careers between the two UCSF primary care programs' alumni was small and not statistically significant (50 % for UCPC and 63.3 % for SFPC, p=0.22).

Our secondary outcomes revealed that while 98/106 (93 %) of primary care alumni agreed or strongly agreed that they were interested in a career in primary care prior to starting residency, 67/106 (63 %) agreed or strongly agreed that they were interested in a career in primary care at the end of residency (Table 2).

This decline in interest in a primary care career may be partially or fully explained by the finding that 88/106 (83 %) of primary care alumni felt that their residency ambulatory clinic experience influenced their subsequent career choice. Notably, 30 of the 34 (88 %) primary care residents who lost interest in a primary care career during residency agreed or strongly agreed that their ambulatory experience during residency influenced their career choice (Table 2).

When focusing on the particular subgroup of individuals who had an initial interest in an outpatient primary care career pre-residency, 23/38 (61 %) of these categorical alumni lost interest in an outpatient primary care career during residency as compared to 34/98 (35 %) of primary care residents; p=0.006 (Table 3).

DISCUSSION

Fifty-four percent of primary care residency alumni continued on to a career in outpatient primary care compared to only 20 % of categorical alumni, demonstrating that training in a primary care residency is more frequently associated with an outpatient generalist career. It is striking, however, that 35 % of alumni in primary care programs who were interested in a primary care career before residency lost their initially stated interest during residency. A majority of these alumni agreed that the ambulatory experience during residency influenced their career choice. At the same time, very few categorical alumni were convinced to pursue a primary care career by the end of residency. Our study demonstrates that while primary care residency programs better foster careers in primary care than categorical programs, there is a significant atrophy of interest in primary care that occurs amongst GIM trainees during residency.

Several potential reasons may account for this loss of interest in primary care during residency. Foremost amongst them

Table 1 Demographic Characteristics of Categorical vs. Primary Care Track Alumni

Characteristic	Categorical Track N=168	Primary Care Track N=106
Gender		
Female (n, %)	80 (48 %)	72 (68 %)
Age (mean±SD)	37.9 (3.4)	39.8 (3.9)
Race or Ethnicity (n, %)		
White (non-Hispanic)	88 (53 %)	65 (61 %)
Black-African American	1 (1 %)	2 (2 %)
Asian-Indian	31 (19 %)	12 (11 %)
Asian-Other	28 (17 %)	16 (15 %)
Hispanic	12 (7 %)	8 (8 %)
Other	6 (4 %)	3 (3 %)

Table 2 Primary Care Career Interest Pre-Residency to Post-Residency and Influence of the Ambulatory Medicine Experience

Agree/Strongly Agree	Program		p value for Pearson Chi Sq (1 df)
	Categorical (n=169) N (%agree)	Primary Care (n=106) N (%agree)	
Interest in Primary Care Pre-Residency	38 (23 %)	98 (93 %)	p<0.001
Interest in Primary Care Post-Residency	24 (14 %)	67 (63 %)	p<0.001
Ambulatory Medicine Experience Influenced Career Choice	96 (57 %)	88 (83 %)	p<0.001

Table 3 Change in Interest in Primary Care During Residency in a Subgroup of Individuals with an Initial Interest in Primary Care Pre-Residency

	Program	
	Categorical (n=38) N (%)	Primary Care (n=98) N (%)
Lost interest in primary care	23 (61 %)	34 (35 %)
Maintained interest in primary care	15 (39 %)	64 (65 %)

*$p = 0.006$

is the ongoing inpatient focus of IM residency training. While most of medicine is practiced in the outpatient realm, the majority of resident training occurs in inpatient settings,[21] even within primary care residencies. In many programs, residents only practice part-time in clinic and are not adequately protected from concurrent inpatient duties.[22,23] Given the noted strain between competing inpatient and outpatient responsibilities,[24] the continuity clinic experience for IM residents can become stressful and there is variable program compliance with ACGME ambulatory training requirements.[25] In an attempt to uncouple inpatient and outpatient training, a few new program models have developed, which include a year long ambulatory block[26] and an alternating 4:1 week inpatient to ambulatory schedule[27–29] that might help to support ambulatory education. Emphasizing outpatient training and education during residency while simultaneously providing protected time to practice ambulatory medicine may help retain resident interest in primary care.

In addition to maximizing protected outpatient training time, there have been multiple appeals for a reform of the clinic experience itself[24,30–34] as satisfaction with IM residency continuity clinic directly influences career choice toward primary care.[31,32] A recent study compared internal medicine residents' likelihood of entering GIM as a result of clinic to likelihood of entering a career in GIM before clinic, and demonstrated that 28 % were less likely to enter GIM as a result of their clinic experience, 59 % had no difference in likelihood, and only 11 % were more likely to enter general IM as a result of clinic.[34] Current attempts to improve the outpatient clinic experience include the development of patient-centered medical homes and accountable care organizations,[35,36] efforts to decrease panel size, and the creation of multidisciplinary, inter-professional teams.[10] These changes should help to train residents in team environments that allow physicians to work at the peak of their training levels and in more satisfying work conditions.[36] Additionally, increased support of non-face to face patient care encounters as well as ambulatory payment reforms[37] might entice debt-ridden residents[38,39] to enter the primary care field.

As insurance coverage broadens in the era of the Affordable Care Act, more PCPs are required to care for an aging population. It is therefore essential to determine which educational efforts ultimately promote careers in primary care amongst future physicians. Calls have been made for a re-evaluation of Graduate Medical Education (GME) funding,[40] and accountability measures will likely grow increasingly important.[7,41–43] Our study has attempted to evaluate the outcomes of primary care residencies, and our results suggest that more work may be needed to improve the existing primary care training experiences. Identified outcomes including retention of primary care interest throughout residency and an ultimate career choice in primary care are likely to be important factors to consider in any future education reform.

This study has several limitations. First, it examined alumni from a single academic center and may not be generalizable to other primary care residencies. Second, we collected cross-sectional data and consequently were able to generate associations, but we cannot prove any causal relationships. In addition, our modest sample size precluded multivariate analyses to adjust for covariates potentially impacting career plans. Third, our data covers a 10-year time frame during which external innovations and changes occurred within GIM that may have influenced our results. For example, the advent of hospitalist medicine may affect the number of residents entering outpatient primary care. While there may also have been changes within the UCSF training programs during the study time, when we analyzed outcomes by year, we found no major trends or differences between groups. Fourth, our outcomes were self-reported, so it is possible that those individuals who participated in primary care tracks might overemphasize their interest in a primary care career before or after residency. The responses of primary care alumni might also be influenced by current attitudes towards primary care. Additionally, those individuals interested in primary care may have had undergraduate medical education experiences that prompted an interest in primary care prior to residency. These residents likely self-select into primary care tracks, thereby potentially minimizing the effects of the program itself. Our results, however, reveal a higher retention of interest in a primary care career amongst graduates of primary care residencies as compared to graduates of categorical programs, suggesting that primary care residencies may reinforce interest in a primary care career better than categorical programs.

In this survey, we did not address whether the clinic experience affected career choice positively or negatively, differences in qualitative and quantitative aspects of ambulatory training between primary care and categorical residencies, or whether the growth of hospitalist medicine might have affected outcomes. These are important areas to explore in future studies.

CONCLUSION

Our study surveyed practicing physicians after graduation from residency to determine whether there might be an association between primary care residency training and a consequent career in primary care. Our results suggest that resident

interest in primary care declines during residency, even when residents are in dedicated primary care tracks. We also found that ambulatory clinic experience influenced eventual career choice amongst those who decided not to pursue a career in ambulatory general medicine. Improving and emphasizing the outpatient clinic experience during residency may be an important factor to further interest in primary care and warrants further research.

Funding: *This study was funded in part by the Clinical and Translational Sciences Institute of the University of California, San Francisco. The UCSF Academy of Medical Educators provided valuable feedback for the construction of the survey instrument, but was not involved in the collection, interpretation, or preparation of the final manuscript.*

Disclosures: *None.*

Ethical Approval: *This study received approval from the UCSF human subjects institutional review board and the San Francisco Veterans Affairs Research and Development Committee.*

Disclaimer: *The views expressed by the authors do not represent those of the Clinical and Translational Sciences Institute of the University of California, San Francisco.*

Previous Presentations: *Limited findings from this study were presented at the UCSF Floyd Rector Research Symposium, San Francisco, CA, May 2014, the Society for General Internal Medicine Annual Meeting, San Diego, CA, April 2014, the Haile T. Debas Academy of Medical Educators Annual Education Symposium, April 2014, and the Society for General Internal Medicine California-Hawaii Regional Meeting, Palo Alto, CA, January 2014.*

Conflict of Interest: *The authors declare that they do not have a conflict of interest.*

Corresponding Author: *R. Jeffrey Kohlwes, MD, MPH; University of California, Veterans' Affairs Medical Center, San Francisco, CA, USA (e-mail: Jeff.Kohlwes@ucsf.edu).*

REFERENCES

1. **Macinko J, Startfield B, Shi L.** Quantifying the health benefits of primary care physician supply in the United States. Int J Health Sev Plan Adm Eval. 2007;37(1):111–126.
2. **Starfield B, Shi L, Macinko J.** Contribution of primary care to health systems and health. Milbank Q. 2005;83(3):457–502.
3. **Cowill JM, Cultice JM, Kruse RL.** Will generalist physician supply meet demands of an increasing and aging population? Health Aff Proj Hope. 2008;27(3):w232–w241.
4. **Cooper RA.** Weighing the evidence for expanding physician supply. Ann Intern Med. 2004;141(9):705–714.
5. **Chen C, Petterson S, Phillips RL, Mullan F, Bazemore A, O'Donnell SD.** Toward graduate medical education (GME) accountability: measuring the outcomes of GME institutions. Acad Med. 2013;88(9):1267–1280.
6. **Garibaldi RA, Popkave C, Bylsma W.** Career plans for trainees in internal medicine residency programs. Acad Med. 2005;80(5):507–512.
7. Council on Graduate Medical Education. Twentieth Report: Advancing Primary Care. Washington, DC: Health Resources and Services Administration; 2010. http://www.hrsa.gov/advisorycommittees/bhpradvisory/cogme/reports/twentiethreport.pdf. Accessed April 6, 2015.
8. **Youngclaus JA, Koehler PA, Kotlikoff LJ, Wiecha JM.** Can medical students afford to choose primary care? An economic analysis of physician education debt repayment. Acad Med. 2013;88(1):16–25.
9. Council on Graduate Medical Education. Nineteenth Report: Enhancing Flexibility in Graduate Medical Education. Rockville, MD: Council on Graduate Medical Education; 2007. http://www.hrsa.gov/advisorycommittees/bhwadvisory/cogme/Reports/nineteenthrpt.pdf. Accessed April 6, 2015
10. **Doherty RB.** Crowley RA, for the Health and Public Policy Committee of the American College of Physicians. Principles Supporting Dynamic Clinical Care Teams: An American College of Physicians Position Paper. Ann Intern Med. 2013;159(9):620–626.
11. American Academy of Family Physicians, American Academy of Pediatrics, American College of Physicians, American Osteopathic Association. Joint Principles of the Patient-Centered Medical Home.; 2007. http://www.aafp.org/dam/AAFP/documents/practice_management/pcmh/initiatives/PCMHJoint.pdf. Accessed April 6, 2015.
12. **Jolly P, Erikson C, Garrison G.** U.S. graduate medical education and physician specialty choice. Acad Med. 2013;88(4):468–474.
13. U.S. Department of Health and Human Services. Affordable Care Act: Primary Care Residency Expansion (PCRE) Program. Frequently Asked Questions.; 2010. http://www.hrsa.gov/grants/healthprofessions/pcrefaqs.pdf. Accessed April 6, 2015.
14. **Clinite KL, Reddy ST, Kazantsey SM, et al.** Primary care, the ROAD less traveled: what first-year medical students want in a specialty. Acad Med. 2013;88(10):1522–1528.
15. **Bennett KL, Phillips JP.** Finding, recruiting, and sustaining the future primary care physician workforce: a new theoretical model of specialty choice process. Acad Med. 2010;85(10 Suppl):S81–S88.
16. What Influences Medical Student and Resident Choices? Washington, DC: Robert Graham Center; 2009.
17. **Dick JF 3rd, Wilper AP, Smith S, Wipf J.** The effect of rural training experiences during residency on the selection of primary care careers: a retrospective cohort study from a single large internal medicine residency program. Teach Learn Med. 2011;23(1):53–57.
18. **West CP, Dupras DM.** General medicine vs subspecialty career plans among internal medicine residents. JAMA. 2012;308(21):2241–2247.
19. **Lipkin M, Zabar SR, Kalet AL, et al.** Two decades of Title VII support of a primary care residency: process and outcomes. Acad Med. 2008;83(11):1064–1070.
20. **Perez JC, Brickner PW, Ramis CM.** Preparing physicians for careers in primary care internal medicine: 17 years of residency experience. Bull N Y Acad Med. 1997;74(1):20–30.
21. **Bowen JL, Salerno SM, Chamberlain JK, Eckstrom E, Chen HL, Brandenburg S.** Changing habits of practice. Transforming internal medicine residency education in ambulatory settings. J Gen Intern Med. 2005;20(12):1181–1187.
22. **Thomas KG, West CP, Popkave C, et al.** Alternative approaches to ambulatory training: internal medicine residents' and program directors' perspectives. J Gen Intern Med. 2009;24(8):904–910.
23. **Wieland ML, Halvorsen AJ, Chaudhry R, Reed DA, McDonald FS, Thomas KG.** An evaluation of internal medicine residency continuity clinic redesign to a 50/50 outpatient-inpatient model. J Gen Intern Med. 2013;28(8):1014–1019.
24. **Nadkarni M, Reddy S, Bates CK, Fosburgh B, Babbott S, Holmboe E.** Ambulatory-based education in internal medicine: current organization and implications for transformation. Results of a national survey of resident continuity clinic directors. J Gen Intern Med. 2011;26(1):16–20.
25. **Willett LL, Estrada CA, Adams M, et al.** Challenges with continuity clinic and core faculty accreditation requirements. Am J Med. 2013;126(6):550–556.
26. **Warm EJ, Schauer DP, Diers T, et al.** The ambulatory long-block: an accreditation council for graduate medical education (ACGME) educational innovations project (EIP). J Gen Intern Med. 2008;23(7):921–926.
27. **Mariotti JL, Shalaby M, Fitzgibbons JP.** The 4:1 schedule: a novel template for internal medicine residencies. J Grad Med Educ. 2010;2(4):541–547.
28. **Heist K, Guese M, Nikels M, Swigris R, Chacko K.** Impact of 4+1 block scheduling on patient care continuity in resident clinic. J Gen Intern Med. 2014;29(8):1195–1199.
29. **Chaudhry SI, Balwan S, Friedman KA, et al.** Moving forward in GME reform: a 4+1 model of resident ambulatory training. J Gen Intern Med. 2013;28(8):1100–1104.
30. **Laponis R, O'Sullivan PS, Hollander H, Cornett P, Julian K.** Educating generalists: factors of resident continuity clinic associated with perceived impact on choosing a generalist career. J Grad Med Educ. 2011;3(4):469–474.
31. **Peccoralo LA, Callahan K, Stark R, DeCherrie LV.** Primary care training and the evolving healthcare system. Mt Sinai J Med N Y. 2012;79(4):451–463.
32. **Meyers FJ, Weinberger SE, Fitzgibbons JP, et al.** Redesigning residency training in internal medicine: the consensus report of the Alliance for Academic Internal Medicine Education Redesign Task Force. Acad Med. 2007;82(12):1211–1219.

33. **Julian K, Riegels NS, Baron RB.** Perspective: Creating the next generation of general internists: a call for medical education reform. Acad Med. 2011;86(11):1443–1447.
34. **Peccoralo LA, Tackett S, Ward L, et al.** Resident satisfaction with continuity clinic and career choice in general internal medicine. J Gen Intern Med. 2013;28(8):1020–1027.
35. **McClellan M, McKethan AN, Lewis JL, Roski J, Fisher ES.** A national strategy to put accountable care into practice. Health Aff Proj Hope. 2010;29(5):982–990.
36. **Lewis SE, Nocon RS, Tang H, et al.** Patient-centered medical home characteristics and staff morale in safety net clinics. Arch Intern Med. 2012;172(1):23–31.
37. **Merrell K, Berenson RA.** Structuring payment for medical homes. Health Aff Proj Hope. 2010;29(5):852–858.
38. **Greysen SR, Chen C, Mullan F.** A history of medical student debt: observations and implications for the future of medical education. Acad Med. 2011;86(7):840–845.
39. Association of American Medical Colleges, Medical Student Education: Debt, Costs, and Loan Repayment Fact Card.;2013. https://www.aamc.org/download/358956/data/12debtfactcard.pdf. Accessed April 6, 2015.
40. **Mullan F, Chen C, Steinmetz E.** The geography of graduate medical education: imbalances signal need for new distribution policies. Health Aff Proj Hope. 2013;32(11):1914–1921.
41. Institute of Medicine. Graduate Medical Education That Meets the Nation's Health Needs. Washington: The National Academies Press; 2014.
42. Medicare Payment Advisory Commission. Report to the Congress: Aligning Incentives in Medicare. Washington, DC: Medicare Payment and Advisory Commission; 2010. http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg77916/pdf/CHRG-111hhrg77916.pdf. Accessed April 6, 2015.
43. **Baron RB.** Can we achieve public accountability for graduate medical education outcomes? Acad Med. 2013;88(9):1199–1201.