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December 5, 2013

Senior Seminar

Final Paper

Primary Care Physician Shortage: Increased Demand and Insufficient Supply

The American Health Care System is in desperate need of reform and the Affordable Care Act (ACA) is attempting to reform the organization, delivery and reimbursement rates associated with the health care system. The current healthcare system enables the provision of fragmented, uncoordinated care, which has contributed to its high costs. Furthermore, the development of the healthcare system has led to a system that is not strongly based on primary care; but is rather based on healthcare freedom, whereby patients are able to see specialists prior to seeing their primary care physician. The result of this system and the much higher income made by specialists is a shortage of primary care physicians. The implementation of the ACA and “the Patient Protection and Affordable Care Act (PPACA) of 2010 has the potential to reestablish primary care as the foundation of the U.S. health care delivery system” (Goodson, 742). However, the current shortage of primary care physicians and the fact that the ACA will increase the demand for more primary care physicians pose significant obstacles to the implementation of the proposed health care reforms. This paper will first describe and analyze the current primary care physician shortage and the factors that have contributed to this shortage. Next, it will describe projections regarding the future primary care physician shortage and, in so doing, will demonstrate that the current shortage will be exacerbated by both demographic changes and the increased demand for PCPs created by the ACA’s encouraged utilization of primary care. Lastly, this paper will analyze the incentives put in place by the ACA to encourage augmentation of the primary care physician workforce. Finally, this paper will argue that the ACA incentives alone will not solve the primary care physician shortage and that additional strategies are needed.

Primary Care Physician Shortage

Currently, Americans are experiencing difficulty accessing primary care physicians. According to the 2008 Medicare Payment Advisory Commission beneficiary survey, twenty eight percent of beneficiaries without a current primary care physician had trouble finding or accessing a new one, which represented a seventeen percent increase from 2006. On the contrary and not surprisingly, the reported difficulty accessing a specialist decreased from eighteen percent in 2006 to eleven percent in 2008. A reported twenty-two percent of Medicare patients and thirty-one percent of privately insured patients reported having an unwanted delay in making an appointment to receive routine care in 2008. Furthermore, although eighty percent of adults reported having a usual doctor or regular source of care, only twenty-seven percent of them reported having easy access to their primary care physician in terms of their ability to schedule timely visits, reach their physician by telephone or receive medical consultation after hours (Bodenheimer and Pham, 801). This data clearly supports the fact that there is a problem with easy access to a primary care physician. Primary care physicians should be available for sick visits, routine annual visits, and general consultation and coordination of care; however, if there are not enough primary care physicians, this becomes increasingly difficult.

In 2012, there were 80.7 active primary care physicians per 100,000 people in the United States (AAMC DataLog). According to the 2008 Medical Expenditure Panel Survey (MEPS), Americans made 462 million office visits to primary care physicians. The American Medical Association (AMA) Masterfile indicates that in 2010, there were approximately 246,900 primary care physicians in direct patient care. After accounting for primary care physicians in retirement or those practicing in emergency departments, the AMA projected that there were approximately 206,369 primary care physicians practicing in an office-based setting. Then, assuming 462 million annual primary care physician visits, with 206,639 primary care physicians, it was estimated that each physician would have 2,237 visits yearly which means that the United States had approximately one primary care physician per every 1,475 persons (Petterson et al., 505).

In order to better elucidate the adequacy and/or inadequacy of the current number of primary care physicians, researchers estimated a reasonable patient panel size for each primary care physician. Altschuler and his colleagues used published estimates from Duke University on the amount of time it takes for primary care physicians to provide acute, chronic, and

preventative care to their patients. They analyzed the implications in patient panel size for primary care physicians working in a team-based model versus those practicing as individual practitioners. The team-based model included physicians, nurse practitioners, physician assistants, registered nurses, pharmacists, health educators, and medical assistants. The idea was that when primary care physicians were in a team-based model, many of the tasks of the primary care physician could be delegated to other members of the team (Altschuler et. al, 397).

Current estimates for individually-practicing physicians suggest that current PCPs would need to spend 21.7 hours per day in order to provide all appropriate preventative, acute, and chronic care for a patient panel size of 2,500 patients, which is close to the average panel size of 2300 patients (Altschuler et al., 396). Clearly, PCPs cannot spend this much time each day with their patients. As a result, patients receive only 55% of their recommended chronic and preventative care. This can lead to inadequate care for patients with chronic illnesses, where it is estimated that 50% of patients with hypertension have uncontrolled blood pressure, more than 80% of patients with hyperlipidemia have uncontrolled cholesterol, and 43% of patients with diabetes have not achieved glycemic control (Altschuler et al, 396.).

The discrepancy between recommended and needed time with patients and the number of primary care physicians led to two different practice models as potential solutions for improved patient care. The first model is based on one individual primary care physician who does not delegate any of his or her responsibilities to other clinicians or members in the primary care field. In order for this model to be effective, the patient panel size would need to be greatly reduced, resulting in one physician reasonably caring for only 983 patients. The alternative model is based on a delegated team model, where the responsibilities of the PCP are allotted to other members of the practice care team. In the most ambitious model with the most responsibilities delegated, one PCP could care for 1,947 patients. In the other two team-based projections with fewer delegated responsibilities, a PCP could care for a panel size of 1,523 or 1,387 patients (Altschuler et al., 398).

Based on these estimates, there is clearly a significant shortage in the number of primary care physicians needed to provide their patients with adequate and appropriate care. Currently in the United States, there is approximately one PCP per 1,475 patients (Pettersen et al., 505). However, Altschuler and colleagues determined that for individually practicing PCPs, the

appropriate patient panel size is 983 patients per primary care physician (Altschuler et al., 398). Thus, there is a huge discrepancy between the suggested reasonable patient panel size for physicians and their current actual patient panel size. This incongruity results in inadequate quality of care for patients and helps explain why patients have trouble accessing their primary care physician for preventative, acute, or chronic care, making timely appointments, scheduling necessary annual or sick visits and also explains why PCPs are unable to dedicate enough time to their patients during their visits.

Factors Contributing to Shortage

In order to understand and help alleviate the current primary care physician shortage, it is necessary to first identify the factors contributing to the shortage. The number of primary care physicians vs. specialists is solely determined by the number of medical students who choose either discipline. In the United States today, only 30% of physicians practice in primary care, whereas 70% practice in specialties (Goodson, 742). From 1997 to 2005, the number of medical school graduates planning a career in primary care dropped 50%, from 54% in 1998 to 23% in 2007 (“How is a Shortage”, 4). Furthermore, according to a 2007 study of fourth year medical students, only 2% of students planned to pursue careers in general internal medicine (“How is a Shortage”, 4). Clearly medical students are not choosing careers in primary care; but, rather, are choosing to pursue careers as specialists. From this, the question arises: why specialties over primary care?

The literature suggests that the main reason why medical students are choosing a specialty over primary care is the tremendous income gap between the two fields of medicine. Over a lifetime, primary care physicians earn much less than their specialist counterparts. In one study, Vaughn and his colleagues examined the income gap between specialists (cardiologists) and primary care physicians. Over the course of his/her lifetime, a cardiologist can expect to earn approximately \$5,171,407; whereas the primary care physician can expect to earn \$2,475,838 (Vaughn et al, 935)—less than half as much for equal amounts of time spent working. Furthermore, data suggests that a cardiologist could live at twice the level of annual living expenses as a primary care physician and, even after accumulating roughly \$625,000 in medical school debt, would still generate more career wealth than a primary care physician living at basic living expenses (Vaughn et al, 936).

Considering the debt accumulated by most medical students, it is no surprise that the large income gap between primary care physicians and specialist is the main reason that medical students do not choose to pursue careers in primary care. Medical school costs often leave students in an exorbitant amount of debt. Approximately 86% of medical school graduates in 2011 had an average debt of \$161,290 (Youngclaus et al., 17). Among these indebted graduates, approximately one quarter of them graduated from private medical schools with over \$250,000 in debt. In order to repay their medical school loans and still have a reasonably high standard of living, physicians require very high annual incomes. A study analyzing loan repayment methods with a primary care vs. specialty salary found that it is plausible for primary care physicians to live a normal lifestyle and repay their loans within ten years of graduation (Youngclaus et al., 18). However, this finding was based on a median loan repayment of \$160,000. Thus, if the debt level were higher than \$160,000, primary care physicians would not be able to repay their loan within ten years and also raise a family and have a reasonably high standard of living. (Youngclaus et al., 20) The ability to pay off education loans is directly correlated with a person's income. Consequently, it is not surprising that medical students burdened with more than \$160,000 in debt would choose a specialized field of medicine over primary care so the physician does not have to live in debt for a majority of his or her life (Youngclaus et al., 21).

Perceptions of primary care and internal medicine also contribute to medical students' decisions to pursue a specialty rather than primary care. A survey of 1,244 medical student seniors at seventeen different medical schools found that only twenty-four percent of them planned on pursuing a career in internal medicine, with only nine percent planning on pursuing general internal medicine (Schwartz et al.) The survey asked students questions about their perception of internal medicine. The students reported that compared to other specialties, "internal medicine was perceived as having more academic challenges on rounds...being more stressful for the residents, demanding more time and having a greater workload as a career and as a residency, and having more uncertainty in its' practice" (Schwartz et al. 10). The students also perceived internal medicine as providing less satisfaction, having a lower income potential and allowing for less leisure time. All of these perceptions were based on the residents' experiences on rounds with internal medicine physicians (Schwartz et al.). The American College of Physicians also performed a comprehensive evidence review and found that "excessive administrative hassles, high patient loads, and declining revenue coupled with the increased cost

of providing care...along with increased medical school tuition rates, high levels of indebtedness, and excessive workloads” were all contributing factors that deterred medical students from the primary care field and attracted them to the specialties (“How is a Shortage”, 3).

Projections on Future Primary Care Physician Shortage: Deepening Crisis

According to the American College of Physicians, “the United States is in the midst of a primary health care workforce crisis that is expected to worsen precipitously in the next decade” (American College of Physicians, 59). As previously illustrated, there is currently an insufficient supply of PCPs and an overwhelming demand. PCPs are currently forced to take on the care of an excess amount of patients at the expense of the quality of the patients’ care. Yet, the worst is yet to come. Both demographic factors and delivery reform proposals in the ACA will exacerbate the demand for PCPs and result in an even greater shortfall in PCP supply.

Demographic factors will contribute significantly to the increased demand for PCPs. In the coming years, the baby boomer population will continue to age and will be in more need of health care. Aging populations are generally sicker populations, due to chronic diseases and an overall decline in health. Therefore, there will be a higher demand for PCPs to help manage chronic illnesses, provide continuous care, and regularly assess patients’ aging health status. Thus, PCPs will be in higher demand (American College of Physicians, 59).

Data from the Census projections confirm these concerns: the population will increase by 15.2% from 2010 to 2025 and the population of people age 65 years or older will expand by 60% while the populations of people 18 years of age or younger will only grow by 13%. Thus, since the population of people aged 65 years or older is more likely to need PCPs, it is projected that the total number of office visits to PCPs will increase from 462 million in 2008 to 565 million in 2025 (Petterson et al., 505). This translates to an increase from an average 1.60 visits per person in 2008 to 1.66 visits per person. To account for this increase in average visits, the United States would need approximately 260,687 PCPs by the year 2025, which is an increase of 51,880 physicians (Petterson et al., 506).

In addition to demographic factors, the delivery and payment reform proposals in the ACA will also increase the demand for PCPs. Through the ACA, a projected 34 million

Americans will gain access to health care through Medicaid expansion and greater access to health insurance (Pettersen et al., 505). This increased expansion alone will account for a need of approximately 8,000 more PCPs (Pettersen et al., 507). However, the ACA will also implement various delivery and payment reforms to help increase quality of and access to care for patients by providing more coordinated and comprehensive care. These reforms will also increase demand for PCPs.

One delivery model proposed in the ACA is the Patient Centered Medical Home (PCMH). The PCMH model is centered on the PCP, who is in charge of providing continuous and coordinated care to patients to ensure better management of illnesses. The PCP works as part of a highly-coordinated team of providers, including specialists, practice care managers, social workers, dietitians, mid-level providers, pharmacists, and family and community occupation therapists (Rosenthal, 427). PCMHs main focus is on “interdisciplinary team practice, payment reform, increased utilization of information technologies, and increased patient access and involvement” (Berryman et al., 167). Furthermore, “evidence shows that patients with a medical home have better access to care, are more likely to receive recommended preventative services, and have chronic conditions that are better managed compared with those lacking a medical home” (Abrams et al., 8). Evidence also suggests that patients in a medical home are less likely to receive duplicate tests, report errors in their care, or go to the emergency room, which can lead to cost savings due to decreased hospitalizations and emergency room use (Abrams et al., 8).

Other delivery reforms centered on coordination of patient care are community health teams and community-based collaborative care networks. Both of these networks will be established to help encourage and coordinate use of medical homes. The Secretary of the Department of Health and Human Services is offering and will award grants to encourage “states, state-designed organizations and American Indian tribes to establish community health teams to support patient centered medical homes” (Abrams et al., 11). The community health teams will coordinate and contract with local PCPs to provide services for patients with chronic conditions such as 24-hour care services and preventative care. The PCP must, however, develop a care plan for each patient and also meet regularly with the patient’s care providers to guarantee coordination and integration of care. These community-based collaborative networks are intended to integrate health care services for low-income populations. Grants proposed in the

ACA to help implement community based collaborative care networks will be used to help low-income populations gain access to and appropriately use medical homes, through transportation assistance, 24-hour care service, telemedicine, etc. These networks include groups of healthcare providers, hospitals with high levels of Medicaid patients, and local health centers (Abrams et al., 11).

The last delivery reform supported in the ACA is Accountable Care Organizations (ACOs). Similar to the previously discussed care delivery models, ACOs consist of a consolidated network of hospitals, health centers, and physicians. An Accountable Care Organization's main objective is to "manage the full continuum of care and be accountable for the overall costs and quality of care for a defined population" (Rittenhouse et al., 2302). Many different organizational structures of ACOs are possible, from small independent practice associations to large integrated delivery systems. Regardless of the size of the organization, there is a strong need for leadership within the organization. According to Rittenhouse and his colleagues, "regardless of the organizational structure, an ACO will not succeed without a strong foundation of high-performing primary care" (Rittenhouse et al., 2302). Although PCPs are not explicitly involved in ACOs, as they are in PCMHs or other delivery models, the ACOs cannot effectively function without the use of PCPs as the leaders and coordinators of care (Rittenhouse et al., 2302).

Lastly, the Affordable Care Act will implement insurance reforms that allow Medicaid and Medicare patients to receive preventative care in primary care settings. As of 2011, approximately 50 million Medicare beneficiaries received free access to preventative care. Additionally, these 50 million beneficiaries also gained access to free annual wellness checkups and received five-to-ten year personalized wellness plans. As of 2013, approximately 40 million Medicaid enrollees also received free access to preventative services with an additional 16 million Medicaid enrollees expected to gain access by 2019 (Abrams et al., 23).

Many of the delivery care reforms implemented in the ACA are built around PCPs and rely on PCPs to coordinate care, which can lead to cost-savings and higher quality of health care services and delivery. Furthermore, the ACA will implement free preventative services for Medicare and Medicaid enrollees, which call for PCPs to administer the preventative care. However, this poses a serious dilemma. If there is a current PCP shortage and a projected

shortage even greater than the current shortage, how will these models be effectively implemented or these incentives for patients carried out without an adequate number of PCPs? The ACA addresses this conundrum by including provisions and incentives intended to increase the PCP workforce and encourage more medical students to enter the primary care field.

Analysis of Affordable Care Act Incentives

The incentives put in place by the ACA are intended to target both medical school students as well as primary care providers. There are two provisions in the ACA that increase payments to PCPs. The first provision provides a 10% bonus to PCPs who participate in Medicare. The bonus will be available for five years, from 2011-2016 and will invest \$3.5 billion to PCPs participating in Medicare. The American College of Physicians estimates that PCPs with average annual Medicare revenue of \$200,000, would receive an additional \$12,000-\$16,000 per year (Abrams et al., 5-6). Furthermore, the ACA will also increase Medicaid reimbursement rates to equal the reimbursement rates of Medicare. This equates to an additional \$8.3 billion for PCPs who accept Medicaid reimbursement (Abrams et al., 6). These two incentives target the current PCP workforce in hopes of stabilizing and expanding this workforce.

In addition to targeting current PCPs, the ACA includes provisions that target primary care workforce training. One of the most well-known primary care workforce provisions in the ACA is the \$1.5 billion allocated for the National Health Services Corps “to provide scholarships and loan forgiveness for primary care physicians, nurse practitioners, and physician assistants practicing in health professional shortage areas” (Abrams et al., 12). The federally supported Primary Care Loan program also offers more favorable loan repayment options by limiting the obligation to practice in primary care fields to a maximum of ten years. It also decreases the interest rate for noncompliance from 18% to 2%. The ACA will also institute the Healthcare Workforce Loan Repayment for pediatric subspecialists and will allocate \$50 million for 2010-2013 and \$30 million for the year 2014 for pediatric medical or surgical specialists (Abrams et al., 26).

As well as implementing financial incentives, the ACA also enhances structural support for training of PCPs through reimplementing of Title VII, Section 747 of the Public Health Services Act in the ACA (Abrams et al., 13). This provision provides “programs to support

workforce education and training and provides funding to expand primary care capacity” (Goodson, 743). It provides financial assistance to trainees, faculty, and health centers involved in training the primary care workforce. Over the next five years, investments made by both the ACA and the American Recovery and Reinvestment Act will help support the training of more than 16,000 new PCPs (Abrams et al., 14).

As demonstrated, primary care incentives are a major focus of the Affordable Care Act. The ACA targets the primary care physicians, the medical students, and training programs to try to increase the primary care workforce. Although these incentives are a good start to addressing the primary care shortage, they may fall short of providing a permanent solution to the overwhelming primary care dilemma. The incentives may fall short due to their inadequacy in fulfilling the needed financial incentives and addressing the income gap between primary care physicians and also due to their lack of support from Congress.

As previously discussed, the major barrier that deters medical students from pursuing careers in primary care is the income gap that exists between primary care and specialists. Yet, the only two reforms in the ACA that directly address this gap are the increased Medicare and Medicaid reimbursement rates. The ACA increases reimbursement by 10% for Medicare and makes Medicaid reimbursements match those of Medicare. However, these increased payments are only in place for five years, from 2011-2016. Thus, even if these incentives entice current medical students to pursue careers in primary care, it is not a long-term solution. John Goodson argues that the increased reimbursement rates “may be insufficient to attract and retain medical graduates in primary care practice without a long-term correction” (Goodson, 743). Congress may be awaiting research that supports this approach; however, there is not enough time to wait for these results. Both current and future medical students need to see the benefits of primary care in the beginning of their training in order to dedicate their career to primary care. If the increased reimbursement rates are only for the next five years, there is no incentive for the medical students entering the field in 2014 to choose primary care. Arguably, that is the generation that most needs targeting, due to the aforementioned change in demographics that will increase the demand for PCPs in the year 2025. Although ACA funds and the American Recovery and Reinvestment Act will help to train 16,000 more PCPs in the next five years, even this great increase is insufficient to solve the shortage problem. There is a projected primary

care shortage of approximately 52,000 physicians by the year 2025; so even if the increase of 16,000 PCPs is maintained and there is an increase of 32,000 PCPs over the next ten years, this will still result in a shortage of 20,000 PCPs. Therefore, the current ACA solutions do not solve the problem.

In addition, many of the ACA provisions are currently unsupported by both the Congress and physician specialists. The funds authorized by the ACA to the National Health Service Corps, federally supported student loan funds, loan repayments, and primary care workforce training (Title VII, Section 747) are all appropriated by Congress. Therefore, there needs to be strong Congressional support of these programs to ensure distribution of the allocated funds. Unfortunately, this has not been the case since “Congressional appropriations for these programs have been nearly eliminated multiple times, only to have a small amount restored” (Goodson, 743). Thus, although there is funding authorized by the ACA, the programs might not actually receive the full amount of these funds due to Congress’s unwillingness to distribute the funds. Without this funding, many of the incentives in the ACA will not be actuated and the physician shortage will not be alleviated. Without loan repayment assistance, increased training of primary care physicians and increased loan funds available for medical students, there is very little hope in increasing the primary care workforce. There needs to be strong and guaranteed Congressional support of these incentives for any of these reforms to have a lasting impact on the primary care workforce. However, since there is not, the ACA falls short in implementing these incentives.

Conclusion

The current healthcare system is suffering from a significant shortage of PCPs since medical students are no longer choosing careers in primary care, but are instead choosing careers as specialists. Medical students are deterred from the primary care field this because there is a large income gap between the two fields of medicine, where specialists are making far more money than their primary care counterparts, and also due to the undesirable perceptions of the primary care field. Not only is there a current primary care shortage, but now there is an even greater projected shortage due to demographic changes and ACA delivery reforms—both of which will increase demand for PCPs. In an effort to address this problem, the ACA has implemented provisions to help: 1) encourage medical students to pursue careers in primary care, 2) increase payments to current PCPs and 3) provide for increased training of the primary care

workforce. However, these incentives are not robust enough to promote permanent change in the primary care workforce. Even with the training of 16,000 more PCPs, there will still be a shortage of approximately 20,000 PCPs. Furthermore, there are no long-term financial incentives in place for students to pursue careers in primary care. Lastly, there is not enough Congressional support to guarantee distribution of the proposed allocations in the ACA. Therefore, the ACA falls short in addressing the primary care physician shortage.

There needs to be guaranteed funding and long-term incentives in place in order to address the major barrier keeping medical students from pursuing careers in primary care: the income gap. Perhaps instead of providing loan repayment improvements for medical students, providing full grants for students who choose to be PCPs is a more viable solution. No matter what, additional solutions are needed to address the significant shortage of PCPs, which in the long run, is the only way that the high costs, insufficient access and poor quality of care associated with the current system will be addressed.

Bibliography

- Abrams, Melinda, et al. *Realizing Health Reform's Potential: How the Affordable Care Act Will Strengthen Primary Care and Benefit Patients, Providers, and Payers*. Ed. The Commonwealth Fund. 1466 Vol. , 2011. Print.
- Altschuler, Justin, et al. "Estimating a Reasonable Patient Panel Size for Primary Care Physicians with Team-Based Task Delegation." *Annals of Family Medicine* 10.5 (2012): 396. Print.
- American College of Physicians. "Achieving a High-Performance Health Care System with Universal Access: What the United States can Learn from Other Countries." *Annals of Internal Medicine* 148 (2008): 55. Print.
- Berryman, Sandra N., et al. "Medical Home Model of Patient-Centered Health Care." *MEDSURG Nursing* 22.3 (2013): 166-96. Print.
- Berry-Millett, Rachel, Sachini Bandara, and Thomas Bodenheimer. "The Health Care Problem no One's Talking about." *Journal of Family Practice* 58.12 (2009): 633-6. Print.
- Bodenheimer, Thomas, and Hoangmai H. Pham. "Primary Care: Current Problems and Proposed Solutions." *Health Affairs* 29.5 (2010): 799-805. Print.
- Chen, Candice, et al. "The Redistribution of Graduate Medical Education Positions in 2005 Failed to Boost Primary Care Or Rural Training." *Health Affairs* 32.1 (2013): 102-10. Print.
- Cooper, Richard A., et al. "Economic and Demographic Trends Signal an Impending Physician Shortage." *Health Affairs* 21.1 (2002): 140-54. Print.
- Faber, Marjan, et al. "Survey Of 5 European Countries Suggests That More Elements Of Patient-Centered Medical Homes could Improve Primary Care." *Health Affairs* 32.4 (2013): 797-806. Print.
- Goodson, John D. "Patient Protection and Affordable Care Act: Promise and Peril for Primary Care." *Annals of Internal Medicine* 152 (2012): 742-4. Print.
- Green, Linda V., Sergei Savin, and Yina Lu. "Primary Care Physician Shortages could be Eliminated through use of Teams, Nonphysicians, and Electronic Communication." *Health Affairs* 32.1 (2013): 11-9. Web. Sept. 20, 2013.
- Grundy, Paul, et al. "The Multi-Stakeholder Movement for Primary Care Renewal and Reform." *Health Affairs* 29.5 (2010): 791-8. Print.
- Hofer, Adam N., Jean Marie Abraham, and Ira Moscovice. "Expansion of Coverage Under the Patient Protection and Affordable Care Act and Primary Care Utilization." *Milbank Quarterly* 89.1 (2011): 69-89. Print.

- How is a Shortage of Primary Care Physicians Affecting the Quality and Cost of Medical Care? A Comprehensive Evidence Review.* Ed. American College of Physicians. White Paper ed., 2008. Print.
- Margolius, David, and Thomas Bodenheimer. "Transforming Primary Care: From Past Practice to the Practice of the Future." *Health Affairs* 29.5 (2010): 779-84. Print.
- Matorin, Anu A, et al. "U.S. Medical Students Choice of Careers and its Future Impact on Health Care Manpower." *Journal of health and human services administration* 22.4 (2000): 495-509. Print.
- Patel, Urvashi B., Carl Rathjen, and Elizabeth Rubin. "Horizon's Patient-Centered Medical Home Program shows Practices Need Much More than Payment Changes to Transform." *Health Affairs* 31.9 (2012): 2018-27. Print.
- Pathman, Donald E., et al. "Outcomes of States' Scholarship, Loan Repayment, and Related Programs for Physicians." *Medical care* 42.6 (2004): 560-8. Print.
- "Outcomes of States' Scholarship, Loan Repayment, and Related Programs for Physicians." *Medical care* 42.6 (2004): 560-8. Print.
- Peccoralo, Lauren A., et al. "Primary Care Training and the Evolving Healthcare System." *Mount Sinai Journal of Medicine* 79.4 (2012): 451-63. Print.
- Petterson, Stephen M., et al. "Projecting US Primary Care Physician Workforce Needs: 2010-2025." *Annals of Family Medicine* 10.6 (2012)Print.
- Recent Studies and Reports on Physician Shortages in the US.* Ed. Center for Workforce Studies Association of American Medical Colleges., 2012. Print.
- Rittenhouse, Diane R., and Stephen M. Shortell. "The Patient-Centered Medical Home Will it Stand the Test of Health Reform?" *The Journal of the American Medical Association* 301.19 (2009): 2038-40. Print.
- Rittenhouse, Diane R., Stephen M. Shortell, and Elliott S. Fisher. "Primary Care and Accountable Care-Two Essential Elements of Delivery-System Reform." *The New England Journal of Medicine* 361.24 (2009): 2301. Print.
- Rosenthal, Thomas C. "The Medical Home: Growing Evidence to Support a New Approach to Primary Care." *Journal of the American Board of Family Medicine* 21.5 (2008): 427-40. Print.
- Schwartz, Mark D., et al. "Medical Students Interest in Internal Medicine." *Annals of Internal Medicine* 114.1 (1991): 6. Print.

Song, Zirui, and Thomas H. Lee. "The Era of Delivery System Reform Begins." *Journal of American Medical Association* 309.1 (2013): 35. Print.

Starfield, Barbara, Leiyu Shi, and James Macinko. "Contribution of Primary Care to Health Systems and Health." *Milbank Quarterly* 83.3 (2005): 457-502. Print.

Vaughn, Bryan T., et al. "Can we Close the Income and Wealth Gap between Specialists and Primary Care Physicians?" *Health Affairs* 29.5 (2010): 933-40. Print.

Youngclaus, James A., et al. "Can Medical Students Afford to Choose Primary Care? an Economic Analysis of Physician Education Debt Repayment." *Journal of Academic Medicine* 88.1 (2013): 16-25. Print.