

ADVISORY COMMITTEE ON TRAINING IN PRIMARY CARE MEDICINE AND DENTISTRY

Priming the Pump of Primary Care
Ninth Annual Report to
the Secretary of the
U.S. Department of Health and Human Services
and to Congress
February 2012

The views expressed in this document are solely those of the Advisory Committee on Training in Primary Care Medicine and Dentistry and do not necessarily represent the views of the Health Resources and Services Administration nor the United States Government.

ADVISORY COMMITTEE ON TRAINING IN PRIMARY CARE MEDICINE AND DENTISTRY

The Advisory Committee on Training in Primary Care Medicine and Dentistry (Advisory Committee) is authorized by sections 222 (42 U.S.C. 271a) and 749 (42 U.S.C. 2931) of the Public Health Service (PHS) Act, as amended by section 5103(d) and re-designated by section 5303 of the Affordable Care Act of 2010. The Advisory Committee was originally established by authority under section 748 of the Health Professions Education Partnerships Act of 1998.

The Advisory Committee provides advice and recommendations on policy and program development to the Secretary of the Department of Health and Human Services, and is responsible for submitting an annual report to the Secretary and to Congress concerning the activities under sections 747 and 748 of the PHS Act, as amended. Reports are submitted to the Committee on Health, Education, Labor, and Pensions of the Senate and the Committee on Energy and Commerce of the House of Representatives. In addition, the Advisory Committee develops, publishes, and implements performance measures and longitudinal evaluations, as well as recommends appropriation levels for Part C of Title VII of the PHS Act, as amended.

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INTRODUCTION

Vision

We envision a health care system that cares for all patients within a Patient-Centered Health Home. The Patient-Centered Health Home, consisting of a team of health care professionals providing coordinated comprehensive care, will require a primary care workforce that can work as an interprofessional team according to each discipline's licensed scope of practice. We believe these teams are central to the goal of eliminating health care disparities and attaining accessible, high-quality, and affordable health care for all of our citizens.

Background

The Title VII, section 747 grant programs have brought improvements in primary care education, faculty development, and workforce capacity. They have helped to identify and disseminate best practices to programs, accrediting bodies, and other stakeholders. These grants have permitted the development of innovative programs that benefit medical trainees throughout the country. Additionally, Title VII, section 747 grants are the foundation for programs that foster among academic leaders and trainees a sense of duty to provide care for underserved communities and populations.

Despite the success of Title VII, section 747 programs, important challenges remain. There is compelling evidence that health care outcomes and costs in the United States are strongly linked to the availability of primary care providers (Baicker & Chandra, 2004; Chang, Stukel, Flood, & Goodman, 2011; Starfield, Shi, & Macinko, 2005). There is also strong evidence that the number of primary care physicians in our country will be insufficient to care for the population (The Physicians Foundation, 2009). In addition, millions of Americans have insufficient access to dental care. Fewer than 50 percent of individuals living in poverty in this country have visited a dentist in the past year, often due to the limited number of dentists practicing within health professional shortage areas (HPSAs). Interventions are required in these key professions to ensure an adequate supply of primary care physicians and dentists, including faculty, as well as to develop practice models and systems to care for the population in an effective and efficient manner.

The pipeline of future primary care medical and dental providers is severely limited, with fewer and fewer graduating medical trainees choosing to enter primary care, especially in rural and underserved areas. For example, primary care physicians currently represent 32 percent of the physician workforce. In 1961, 50 percent of U.S. physicians were generalists, the term for primary care at the time (Council on Graduate Medical Education, 2010). The current proportion of primary care physicians is declining, and pipeline programs are needed in order to change the trend. Admission policies must be designed to matriculate trainees more likely to enter into primary care and to complement programs designed to increase the pipeline of these trainees. Furthermore, increasing the overall number of medical school matriculants will be meaningless without a corresponding increase in the number of residency training slots supported by the Federal Government.

Faculty role models and mentors play an important role in career selection for trainees. We also believe that mentoring programs can improve trainee performance and retention in medical or

dental school (Thomson, Ferry, King, Martinez-Wedig, & Villarreal, 2010). Therefore, funding for faculty development is needed to ensure that sufficient faculties are available and appropriately trained to teach primary care medicine and dentistry and perform primary care research. These programs are crucial, for schools and residency programs are finding and retaining fewer faculty members that possess the skills to educate and mentor new medical and dental trainees. These trends are likely to continue, due to issues such as the pay gap between private practice and academia. The dental profession, in particular, is facing a serious shortage of full-time dental faculty. Areas of potential faculty development include information technology, interprofessional practice, and integrated team models.

Trainees in the various medical professions are typically taught in isolated silos, often inadequately prepared for working in an interprofessional team. Therefore, interprofessional education is a vital curriculum component to ensure that future medical and dental providers can engage in interprofessional practice upon graduation. However, the lack of understanding of each other's roles and lack of training in interprofessional collaboration among providers are key barriers to effective interprofessional practice. As noted in the eighth annual report by the Advisory Committee, members of teams must be trained together to fully function as interprofessional practice teams (Advisory Committee on Training in Primary Care Medicine and Dentistry, 2010). The inclusion of interprofessional education in training curricula would remedy this barrier with future medical and dental providers.

Measurement of the effectiveness of Title VII, section 747 and 748 programs is critical to demonstrating its strategic importance to stakeholders. It is also important for identifying and disseminating best practices. Therefore, the Advisory Committee is vitally interested in exploring the development and implementation of tools to evaluate grant programs and the primary care workforce.

Vulnerable populations often have limited access to health care, due to factors such as low income, lack of health insurance, an insufficient number or maldistribution of providers, or providers who cannot afford to offer uncompensated care. As noted in the Institute of Medicine (IOM) report *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care* (2003), racial and ethnic minorities have higher rates of morbidity and mortality than non-minorities, requiring a comprehensive, overall strategy to address issues of access and quality of health care.

The primary care workforce must also be equipped to address the epidemiology of the health issues in underserved communities as well as significant societal and demographic changes that create new challenges to the health care system. For instance, Hispanics accounted for more than half of the 27.3 million increase in U.S. population from 2000–2010 (U.S. Census Bureau, 2011). This increase may require specific population-based health interventions. According to the Centers for Disease Control and Prevention (CDC), Mexican Americans are disproportionately affected by diabetes, and Hispanic women are greater than 2 times more likely than non-Hispanic white women to receive late or no prenatal care (CDC, 2010). While most efforts to advance health care in the United States have focused on the treatment of acute disease in individuals, providers must acquire new competencies to respond to population-based health care needs.

The Advisory Committee reviewed challenges and made recommendations in the following important areas:

RECOMMENDATION 1

Programs for Pre-Clinical and Pre-Professional Trainees
Title VII, section 747 and 748 training grants should provide:

- a. Emphasis on grants that facilitate primary care exposure for pre-clinical trainees.
- b. Support and emphasis on programs that provide incentives for trainees to enter into primary care pipeline programs that offer experience, exposure, and continuity of care in settings such as the Patient-Centered Health Home. Targeted trainees would include pre-clinical (i.e., first/second year medical trainees) and pre-professional (i.e., high school/college trainees).
- c. Grant allocation, including support for paid teaching time, for medical school faculty instruction of pre-clinical and pre-professional trainees.
- d. Clinical training in team-based practice models such as the Patient-Centered Health Home. HRSA should allow inter-institutional collaborative grant projects by removing administrative barriers to collaborative grants.
- e. Development of collaborative partnerships with pipeline programs such as Health Careers Opportunity Programs (HCOPs) and Area Health Education Centers (AHECs), both programs administered by HRSA.

RECOMMENDATION 2

Performance Measures and Evaluation in Admissions Criteria

Title VII, Part C training grants should provide funding for those programs that implement performance measures and longitudinal evaluation of their admissions criteria. Appropriations should be prioritized to fund programs that demonstrate either a satisfactorily consistent level of graduates, or an increasing proportion of graduates, entering and remaining in primary care, who practice in rural or federally-designated underserved areas.

RECOMMENDATION 3

Faculty Members as Mentors and Role Models

Title VII, section 747 and 748 training grants should assist in ensuring that faculty members are available and appropriately equipped to serve as mentors and role models, thereby encouraging trainees to enter careers as providers in medical-dental home settings, rural and underserved areas, and with diverse and vulnerable populations. Grants could include initiatives in developing:

- a. Expectations for curricula and competencies for faculty in Title VII programs, with special emphasis on the development of community health center faculty. Faculty development should include skills in leadership and educational excellence, team approaches to care, engagement in systems-based practice, and development of expertise in the care of underserved populations.
- b. Mentoring programs for faculty, by senior faculty, who have demonstrated success in

providing care for underserved communities. Continuing education formats should be provided for faculty who address competencies necessary to effectively work with the underserved, so faculty can provide guidance and mentorship to trainees.

RECOMMENDATION 4

Assessment Tools for Title VII, Section 747 and 748 Programs

HRSA should provide support to demonstrate outcomes, evaluate impact, and encourage the development of assessment tools for Title VII, section 747 and 748 programs. Outcomes should demonstrate the number of trainees who selected and remained in primary care, and assessments should measure program success in developing a diverse primary care workforce that is equipped to address current health needs and focus on the care of underserved populations.

- a. Support should include establishing a central (HRSA) data repository of Title VII grantees and matriculants to aid in the dissemination of evaluation tools among Title VII grantees. HRSA should also provide additional funding to grantees to monitor long-term outcomes of trainees, including trainees' career selection, retention in primary care, and choice to work in underserved areas. In addition, HRSA should provide support for demonstration projects on trainee tracking systems.
- b. Evaluation tools must also be developed to measure faculty retention, the number of mentoring relationships, faculty perceptions regarding the success of mentoring efforts, faculty retention and promotion, and the number of established linkages between Title VII, section 747 and 748 programs and community health centers.

RECOMMENDATION 5

Recruitment Strategies

To enable support for recruitment strategies for future primary care medical and dental providers, a revised reimbursement model should acknowledge the value of coordinated care that emphasizes prevention and provides chronic care management. The Advisory Committee also supports mechanisms of practice transformation and physician payment to reduce salary disparities between primary care medical and dental providers and their subspecialty colleagues.

RECOMMENDATION 6

Care for an Expanded Number of Vulnerable Populations

The Advisory Committee endorses the definition of vulnerable populations, described in the Affordable Care Act of 2010 as children, older adults, homeless individuals, victims of abuse or trauma, and individuals with HIV/AIDS, disabilities, mental health, or substance-related issues. The Advisory Committee believes underserved groups, including low-income, low-education, and racial ethnic minorities, should be added to the list. Programs should prepare trainees to provide care for this expanded number of vulnerable groups.

RECOMMENDATION 7

Competencies for Primary Care Practice

The Advisory Committee recommends funding for training innovations that focus on competencies needed for primary care practice, including those related to population health, a public health

perspective in clinical decision making, systems practice, and interprofessional collaboration.

RECOMMENDATION 8

Dental Faculty Programs

The Advisory Committee recommends establishing faculty development programs under Title VII, section 748 for primary care dental faculty who will serve as role models in educating trainees in primary care programs, including the development of new compensation models to encourage faculty to stay as instructors in primary dental programs.

RECOMMENDATION 9

Dental Applications from Underserved and Rural Areas

The Committee recommends that Title VII, section 748 training grants give emphasis to applications that target recruitment and admission of trainees from underserved and rural areas, with special focus on underrepresented minorities. In addition, grants should facilitate creating innovative trainee recruitment and admission programs to target trainees who have demonstrated a commitment to community service.

RECOMMENDATION 10

Public Dentistry Practice

The Advisory Committee recommends the creation of Title VII, section 748 grants for infrastructure development of programs for both faculty and dental trainees to prepare for careers in the Nation's increasing number of health centers and safety net programs.

RECOMMENDATION 11

Dental Workforce Models

The Advisory Committee does not endorse any particular dental workforce model, but recognizes that a variety of models need to be studied. Title VII, section 748 grants should evaluate the outcome measures of various dental workforce models in terms of their effect on health outcomes, fiscal efficiencies, and effective access within the national safety net for Medicaid recipients and the uninsured.

These recommendations are described in this report.

Recommendations

1. Programs for Pre-Clinical and Pre-Professional Trainees
Title VII, section 747 and 748 training grants should provide:

- a) Emphasis on grants that facilitate primary care exposure for pre-clinical trainees.
- b) Support and emphasis on programs that provide incentives for trainees to enter into primary care pipeline programs that offer experience, exposure, and continuity of care in settings such as the Patient-Centered Health Home. Targeted trainees would include pre-clinical (i.e., first/second year medical trainees) and pre-professional (i.e., high school/college trainees).

- c) Grant allocation, including support for paid teaching time, for medical school faculty instruction of pre-clinical and pre-professional trainees.
- d) Clinical training in team-based practice models such as the Patient-Centered Health Home. HRSA should allow inter-institutional collaborative grant projects by removing administrative barriers to collaborative grants.
- e) Development of collaborative partnerships with pipeline programs such as Health Careers Opportunity Programs (HCOPs) and Area Health Education Centers (AHECs), both programs administered by HRSA.

Problem/Opportunity for Improvement

In the past decade, fewer and fewer graduating medical trainees chose to enter primary care. Primary care physicians currently represent 32 percent of the physician workforce in the U.S.; this percentage is composed of family physicians (12.7 percent), general internists (10.9 percent), general pediatricians (6.8 percent), and general practice (1.6 percent). In 1961, generalists comprised 50 percent of all U.S. physicians (American Academy of Family Physicians, 2010; Graham, Roberts, Ostergaard, Kahn, Pugno, & Green, 2002; COGME, 2010).

Similarly, in the past decade, proportionally fewer physician assistants worked in primary care, down from 50 percent of all physician assistants in 2000 to just 31 percent in 2010, despite the overall population increase of physician assistants from 20,314 in 2000 to 25,930 in 2010 (American Academy of Physician Assistants, 2011).

Currently, the proportion of primary care physicians is declining. The percentage of U.S. allopathic seniors graduating from medical schools and choosing residency slots in family medicine has declined from 14.7 percent in 1999 to 7.8 percent in 2010, yet these 2010 graduates filled 44.8 percent of all family medicine positions. In 2010, 14,992 U.S. allopathic seniors were matched into residencies. As noted in Figure 1 for 2010, 7.8 percent matched in family medicine, 18.2 percent matched in internal medicine, and 11.4 percent matched in pediatrics (National Resident Matching Program, 2010). As a result, only 37 percent of U.S. allopathic seniors who matched in the NRMP in 2010 are likely to practice primary care, and many of these seniors will continue on to subspecialize, reducing the numbers truly practicing primary care to a much lower total. In contrast, 44 percent of pediatric trainees who complete residencies are likely to practice general pediatrics, and most pediatric medical subspecialties and surgical specialties are experiencing workforce shortages (COGME, 2010; Freed, Dunham, Jones, McGuinness, Althouse, & Research Advisory Committee of the American Board of Pediatrics, 2009). Data reported by COGME state that less than 20 percent of U.S. medical school graduates plan careers in primary care (COGME, 2010). In addition, the Robert Graham Center has published a study showing that measurement of practice type five years post-graduation from medical school is a much better indicator of primary care numbers than data that counts the number of seniors matching into medical residencies (Pettersen, Burke, Phillips, & Teevan, 2011).

Results differ for graduating osteopathic medical trainees. These graduates are able to participate in the NRMP, which matches trainees to programs accredited by the Accreditation Council for Graduate Medical Education (ACGME), as well as in the match for osteopathic graduate medical

education programs conducted by the American Osteopathic Association (AOA). In 2010, 1,444 U.S. osteopathic seniors were matched into residencies through ACGME and 2,075 were matched through AOA (NRMP, 2010; AOA, email communication, May 20, 2011). As noted in Figure 1 for 2010, 18.7 percent of ACGME matches and 21.7 percent of AOA matches were in family medicine, 20.2 percent of ACGME matches and 17.2 percent of AOA matches were in internal medicine, and 13.9 percent of ACGME matches and 2.5 percent of AOA matches were in pediatrics. For graduating osteopathic medical trainees, the largest number of programs and trainees are in family practice. In 2010, 1,213 osteopathic physicians were participating in the graduating osteopathic medical education program, representing 23 percent of all trainees enrolled in such programs (Freeman, DeRosier, & Lischka, 2011).

The Association of American Medical Colleges (AAMC) predicts an estimated physician shortage, in all specialties, of 130,600 by the year 2025. This projection includes both changes resulting from the Affordable Care Act of 2010 as well as physician retirements and specialty choice (AAMC, 2010).

Figure 1: Number and Percentage of U.S. Allopathic/Osteopathic Seniors Matching in Primary Care, 2006–2010

Specialty	Year	M.D.		D.O. - ACGME		D.O. - AOA	
<i>Family Medicine</i>	2010	1,169	7.8%	270	18.37%	451	21.7%
	2009	1,071	7.4%	244	17.3%	438	21.9%
	2008	1,156	8.1%	264	19.7%	354	19.4%
	2007	1,096	7.7%	227	20.0%	---	---
	2006	1,123	8.0%	221	21.6%	---	---
<i>Internal Medicine</i>	2010	2,722	18.2%	292	20.2%	357	17.2%
	2009	2,632	18.1%	306	21.7%	312	15.6%
	2008	2,660	18.5%	264	19.7%	248	13.6%
	2007	2,680	18.9%	233	20.5%	---	---
	2006	2,668	19.0%	233	20.8%	---	---
<i>Pediatrics</i>	2010	1,711	11.4%	200	13.9%	51	2.5%
	2009	1,682	11.5%	190	13.5%	59	3.0%
	2008	1,610	11.2%	213	15.9%	49	2.7%
	2007	1,694	11.9%	129	11.4%	---	---
	2006	1,668	11.9%	122	11.9%	---	---

Note 1:

Source for M.D. and D.O./ACGME data: National Resident Matching Program (NRMP). (2010) *Results and Data; 2010 main residency match*. Retrieved from <http://www.nrmp.org/data/resultsanddata2010.pdf>. Refer to Tables 10 and 11.

Source for AOA data: American Osteopathic Association (AOA). (2011). Retrieved from T. Lischka, email communication, May 19 and 20, 2011.

Note 2: Prior to 2008, D.O. trainees entered AOA specialty programs in postgraduate year 2 (PGY-2) once they completed an osteopathic internship during PGY-1. Since 2008, nearly all D.O. trainees enter AOA specialty programs, including primary care, in PGY-1. Percentages are based upon the total number of seniors matched—for example, the M.D. Family Medicine 2010 match of 1,169 divided by a M.D. total 2010 match of 14,992 results in a 7.8 percent match into Family Medicine for 2010.

In the present workforce, there is a substantial reduction in the production of primary care physicians from graduate medical education due to the (a) expansion of subspecialty training

options, (b) loss of primary care training positions, especially in family medicine, and (c) choice of alternate careers. Alternate career choices include part-time and reduced hours that physicians may undertake for part of, or throughout, their entire career. Additionally, some physicians choose to leave the practice of clinical medicine for an extended period of time, then reenter the workforce later (Jewett, Brotherton, & Ruch-Ross, 2011). Hospitals represent another career option. In many cases, practicing as a hospitalist provides a more controllable lifestyle. This career option can also contribute to the work/life balance of physicians, for it has the potential to increase the manageability and productivity of office practice. Overall, these career options have effectively reduced primary care production by one-third over the last decade (COGME, 2010).

This trend away from primary care is also evident in the practice patterns of physician assistants, for their employment in the medical and surgical specialties has increased from 50 percent in 2000 to 69 percent in 2010. Conversely, the percentage of recently graduated physician assistants working in primary care has decreased from 49 percent in 2000 to 33 percent in 2010, and the overall percentage of physician assistants working in primary care has decreased from 50 percent in 2000 to 31 percent in 2010 (AAPA, 2011).

Medical schools must have a defined department and faculty in Community and Family Medicine, because schools that include a primary care mission clearly provide an encouraging environment for trainees pursuing a primary care specialty (Macy Foundation, 2010). The Advisory Committee suggests that faculty should be involved in the teaching of medical and physician assistant trainees during pre-clinical and clinical years of training.

Several primary care pipeline programs for medical, physician assistant, and dental trainees are available for identifying trainees who have a potential interest and for stimulating that interest in primary care. For example, the Mercer University School of Medicine includes curricula with a mandatory eight-week family medicine clerkship as well as community science and pre-clinical office practice programs. Recent school statistics show that 36 percent of practicing graduates became family practice physicians, and 21 percent became general internists (Macy Foundation, 2010).

Applicant and admissions data, available through the Central Application Service for Physician Assistants (CASPA), indicate that less than 6 percent of matriculants into a physician assistant program cite career and guidance counselors, health professions advisors, or teachers as an influence on their career selection. Instead, 63 percent of matriculants report learning about the physician assistant profession and available career options through direct exposure to the health care delivery system (CASPA, 2011). Therefore, greater support for innovative pipeline programs and pre-clinical primary care projects for medical, physician assistant, and dental trainees may influence career choices among all future primary care practitioners. In addition, more assistance will be needed to expand the primary care workforce and train primary care providers who more closely resemble the population they serve. Until there are more racially, ethnically, and culturally diverse trainees in these programs, efforts should be made to train and educate the existing workforce to provide culturally effective care. The emphasis should not be on the process, but rather the outcomes of culturally-effective care. As noted within the core principles of *Partnership for a Primary Care Workforce*, there must be expansion in recruitment, loan repayment, and scholarship

opportunities to provide the critical incentives for U.S. health professional trainees to pursue careers in underserved areas (AACOM, 2008).

There is increasing evidence that interprofessional practice can provide a range of valuable contributions with regard to health care outcomes (Remington, Foulk, & Williams, 2006; Reeves et al., 2008; Hammick, Freeth, Koppel, Reeves, & Barr, 2007). However, lack of understanding of each other's roles and lack of training in interprofessional collaboration among providers are key barriers to effective interprofessional practice (Brashers, Curry, Harper, McDaniel, Pawlson, & Ball, 2001). Trainees in the various health care professions are typically taught in isolated silos. After graduation, they often have inadequate preparation for working collaboratively in interprofessional teams (McNair, 2005).

Effective interprofessional education can provide trainees with requisite skills to work effectively in interprofessional teams. As noted in a 2010 Macy Foundation report, educational institutions must incorporate the following core competencies, exemplified by principles of the Patient-Centered Health Home, into the education of future health care providers: (a) patients visit a personal physician on an ongoing basis; (b) a personal physician leads a team of health care professionals who provide care; (c) a personal physician coordinates patient care throughout all health care needs and all phases of a patient's life; and (d) information technology, registries, and health information exchanges facilitate coordination of patient care. These competencies are essential for meeting the health care demands of the 21st Century because primary care is the focal point of the U.S. health care system. In conjunction with principles of the health home care model, future health care providers must also understand how: (a) leadership, practice systems, and group dynamics contribute to quality improvement; (b) teamwork with physician assistants, nurses, pharmacists, mental health providers, and social workers improves patient care and mitigates primary care shortages; (c) cultural competency education leads to more effective and equitable health care; (d) counseling patients and engaging in teamwork with other health professionals encourage disease prevention and health promotion in patients; and (e) proactive care through planned visits, ongoing follow up, and patient participation in decision making promotes patient-centered primary care. Understanding these factors will contribute as much to the success of future providers as abilities in diagnosis and treatment (Macy Foundation, 2010).

Practice models such as the Patient-Centered Health Home can provide an effective framework for achieving optimal interprofessional care coordination. The American Academy of Pediatrics (AAP) first advanced the concept of a Patient-Centered Health Home as a central location for archiving a child's medical records and as an accessible, continuous, comprehensive, family-centered, coordinated, and compassionate approach offering culturally-effective care (AAP, 2011). Incorporating practice models such as this one into training will result in trainees with improved skills for working collaboratively in team-based models.

Interprofessional education faces a number of challenges. For example, curricula at professional schools are already crowded, and obtaining necessary administrative support and other resources can be difficult. Also, the scope of interprofessional education extends beyond one health care specialty, and not all schools offer training in all areas. Inter-institutional collaborative grants can

help address such challenges. Joint grantees can pool resources and conduct complementary efforts. Such grants should be flexible to accommodate a range of program designs and types of trainees targeted. Many academic institutions are facing continued fiscal pressures. This approach would reduce the need to maintain redundant structures by evolving towards an approach based on collaborative health professions training.

To encourage robust pipeline programs, Title VII, section 747 training grants should be used to develop collaborative partnerships with HCOPs and AHECs. HCOPs increase pre-medical trainee awareness of health careers through exposure to topics covering primary care medicine, whereas AHECs are academic-community partnerships that provide health career recruitment programs for K-12 trainees. Funding to expand Title VII programs would continue the legacy that these programs provide in increasing the pipeline of physicians in primary care disciplines (Macy Foundation, 2010). Such partnerships can also increase the pipeline of highly qualified high school and college trainees expressing an interest in primary care. One of the challenges with pipeline programs is maintaining high levels of retention. Creating partnerships between Title VII programs and pipeline programs can provide the continuity that reduces pipeline attrition.

Benefits of Adopting this Recommendation

- Increased exposure of pre-professional trainees to primary care medicine can lead to a greater number of applications and admissions among those trainees more likely to enter primary care specialties.
- Creation of training opportunities for participants in pipeline programs is beneficial for the participants and enlarges the pool of Title VII trainees.
- Effective interprofessional education that incorporates practice models such as the Patient-Centered Health Home will result in trainees with improved skills for working collaboratively in team-based models.
- Inter-institutional collaborative grant projects will allow grantees to share resources and office programs they could not offer on their own.

2. Performance Measures and Evaluation in Admissions Criteria

Title VII, Part C training grants should provide funding for those programs that implement performance measures and longitudinal evaluation of their admissions criteria. Appropriations should be prioritized to fund those programs that demonstrate either a satisfactorily consistent level of graduates, or an increasing proportion of graduates, entering and remaining in primary care, who practice in rural or federally-designated underserved areas.

Problem/Opportunity for Improvement

Trainee emphasis on primary care upon entry to medical school is correlated to the eventual practice of primary care. In addition, trainee selection of primary care professions is correlated with certain trainee demographic characteristics and attitudes. These factors include previous experience working in an underserved environment and having been born or raised in a rural or urban underserved area (Rosenthal, 1996; Phillips et al., 2009; Senf, Campos-Outcalt, & Kutob, 2003).

Trainees originating from a rural area are nearly twice as likely to choose family medicine. In addition, there is a 50 percent increase in probability that these trainees will choose primary care or serve in a health center, and a 30 percent increase in probability that these trainees will practice in an underserved area (Phillips et al., 2009). There is also evidence that minority physicians are more likely to practice in primary care disciplines than their non-minority counterparts, and that minority physician assistants are more likely to practice in medically underserved areas (Winkleby, 2007).

Mullan demonstrated that historically black colleges and universities graduate significantly more underrepresented minorities as well as high numbers of physicians who work in primary care and underserved areas (Mullan, Chen, Petterson, Kolsky, & Spagnola, 2010). This research also determined that medical schools in less urban areas graduate more primary care physicians who practice in underserved areas. Conversely, medical schools from the Northeastern United States graduate fewer primary care physicians who practice in these areas.

Admission policies, designed to encourage matriculation of trainees likely to enter primary care fields, can complement programs designed to increase the pipeline of such trainees (see sidebar). Such programs could provide a funding emphasis for schools that have a primary care track or rural training track as well as provide funding for trainees receiving primary care training in a pre-doctoral setting. As noted in the COGME report, *Advancing Primary Care*, the Affordable Care Act of 2010 provides tax exclusions. Loans through the National Health Service Corps, as well as certain state-funded student loans, are excluded from federal income taxation. In addition, there could be an expansion of education debt relief programs such as community-based sponsorships, tax credits, and reductions in training time. An expansion of loan repayment and debt forgiveness programs at the federal and state level would provide a vital contribution to securing a larger primary care workforce to serve the U.S. health care needs of the 21st Century (COGME, 2010).

Increasing numbers of professional schools have implemented programs which employ interventions such as role modeling, academic enrichment, research apprenticeships, and academic partnerships between public school districts and professional schools. For example, the University of New Mexico's School of Medicine and College of Arts and Sciences have developed a combined B.A./M.D. program to increase medical school class size and address physician shortages in underserved areas of the state. The program recruits trainees from rural and underserved areas and offers exposure to primary care throughout their education, including a rural medicine preceptorship and an opportunity to work with a community physician mentor. Early results indicate strong interest from applicants, high retention rates, and enthusiasm among trainees and faculty (Cosgrove et al., 2007).

Another intervention, the Stanford Medical Youth Sciences Program, provides exposure to students in terms of science, mentoring, college admissions preparation, and guidance in long-term careers. This program has been effective in increasing the number of underrepresented trainees in the health care professions (Winkleby, 2007).

"Pathways" programs have also been provided in rural settings to facilitate admission to medical school for rural pre-medical trainees. This effort is accomplished by carefully selecting rural college trainee graduates who show significant interest in rural medicine and

proficiency in undergraduate coursework. A four-week summer program at a medical school in Louisville, Kentucky provides opportunities for trainees to shadow physicians practicing in rural settings, participate in science tutorials, learn concepts of community assessment, and apply for early assurance admission to medical school (Crump, Fricker, & Crump, 2010).

Rabinowitz and colleagues conducted a systematic review of medical school programs designed to increase rural physician supply and constructed a model to study the impact of replicating a rural supply program at 125 allopathic medical schools. If each school established similar programs for 10 trainees per class, the model predicts that over 11,000 rural physicians would be produced over the next decade (Rabinowitz, Diamond, Markham, & Wortman, 2008).

Primary Care Matriculation Programs

Two examples of admission programs designed to encourage matriculation into primary care are the University of North Texas Health Science Center, Texas College of Osteopathic Medicine (UNTHSC TCOM) rural primary care track and the 3-year Lake Erie College of Osteopathic Medicine (LECOM) Primary Care Scholars track. The UNTHSC TCOM curriculum spans all 4 years and includes rural medicine-focused course work, rural clinical experience in all 4 years, and a total of 16 weeks of rural primary care clinical core training in years 3 and 4. According to the school, 54 percent of graduates practice in primary care fields. In 2006, LECOM began offering the Primary Care Scholars Pathway (PCSP), which condenses the traditional 4-year osteopathic medical school curriculum into 3 calendar years, saving one year's tuition cost while providing a stream of osteopathic family medicine trainees (Macy Foundation, 2010).

Benefits of Adopting this Recommendation

- Pre-professional programs could recruit trainees who otherwise may not apply to professional school.
- Primary care would be available for the Nation as a whole, not only for medically vulnerable populations or for those in rural or underserved areas. Performance measures and evaluations must be related to increasing the proportion of graduates practicing in rural or federally-designated underserved areas.
- Grants would provide funding for those programs that implement performance measures and longitudinal evaluation of admissions criteria; the measurement would assess the number of providers practicing primary care in those areas, not just those initially entering primary care residency programs.
- Primary care tracks could increase entrance to and retention of trainees in professional schools and in primary care.
- Recruitment of trainees from rural and underserved areas will increase the numbers of providers entering primary care practice.

3. Faculty Members as Mentors and Role Models

Title VII, section 747 and 748 training grants should assist in ensuring that faculties are available

and appropriately equipped to serve as mentors and role models, thereby encouraging trainees to enter careers as providers in medical/dental home settings, rural and underserved areas, and with diverse and vulnerable populations. Grants could include initiatives in developing:

Expectations for curricula and competencies for faculty in Title VII programs, with special emphasis on the development of community health center faculty. Faculty development should include skills in leadership and educational excellence, team approaches to care, engagement in systems-based practice, and development of expertise in the care of underserved populations.

- a) Mentoring programs for faculty, by senior faculty, who have demonstrated success in providing care for underserved communities. Continuing education formats should be provided for faculty who address competencies necessary to effectively work with the underserved, so faculty can provide guidance and mentorship to trainees.

Problem/Opportunity for Improvement

Title VII, section 747 and 748 programs can provide an essential foundation and key resources for faculty development. Areas for potential faculty development include information technology, interprofessional practice, and integrated team models.

Mentoring can also be an important component of faculty development, and used within many organizations to attract and retain employees, improve productivity, and increase employee satisfaction. In the early stages of a medical career, mentoring can lead to high career satisfaction and guide the development of professional expertise (Ramanan, Taylor, Davis, & Phillips, 2006). An example of a mentoring program is the Family Medicine Preceptorship Program of the California Academy of Family Physicians (CAFP). This program funds first-year medical trainees to explore careers in family medicine through CAFPs summer Family Medicine Preceptorship Program, in which participating trainees spend four weeks precepting full-time with a family medicine physician. Another mentoring program is the Premedical Honors College (PHC) at the Center for Collaborative and Interactive Technologies (CCIT) at Baylor College of Medicine. This is an eight-year B.S./M.D. program created to increase the number of physicians providing care for underserved populations in Texas. As of the time of this review, 84.5 percent of the participants had matriculated into medical school. An outcomes study comparing the participants in this program with trainees of similar academic characteristics, demographics, and interest in medicine found that PHC participants were seven times more likely to matriculate into medical school than the control group (Thomson, Ferry, King, Martinez-Wedig, & Michael, 2003).

Mentors among health professional faculty are also effective for trainees. In a survey of the five independent internal medicine residency training programs affiliated with Harvard Medical School, Ramanan and colleagues examined the development of mentoring relationships during residency training (Ramanan, Taylor, Davis, & Phillips, 2006). Ninety-three percent of respondents reported that it is important to have a mentor during residency, though only half identified a current or past mentor.

The longitudinal mentoring of medical trainees by faculty has a significant effect on primary career selection. A recent study revealed that 33 percent more trainees entered primary care when mentored by a primary care physician from the first year of medical school through graduation.

Such mentoring allows the trainee to achieve a thorough understanding of primary care, and a valuable opportunity to observe a mentor's interaction with patients, trainees, and colleagues. The study also noted that monthly emails to the mentor, communicating the trainee's current coursework, prompted mentors to discuss pertinent and timely matters with the trainee (Indyk, Deen, Fornari, Santos, Lu, & Rucker, 2011).

Developing and maintaining the continuity of a relationship throughout training is essential to effective mentoring. Infrastructure is required to support the mentors and prevent burnout. Mentors who are well supported can maintain their status as positive role models for trainees. Primary care faculty who are satisfied in their careers make better role models for trainees considering careers in primary care. Too often, mentoring is approached from a volunteer perspective, recruiting already busy preceptors and instructors to contribute additional time. Successful mentoring programs incorporate funding for mentors to permit them time to mentor trainees.

Benefits of Adopting this Recommendation

- Mentoring leads to higher career satisfaction and improved professional development.
- Mentoring can improve the pipeline of primary care trainees.

4. Assessment Tools for Title VII, Section 747 and 748 Programs

HRSA should provide support to demonstrate outcomes, evaluate impact, and encourage the development of assessment tools for Title VII, section 747 and 748 programs. Outcomes should demonstrate the number of trainees who selected and remained in primary care, and assessments should measure program success in developing a diverse primary care workforce that is equipped to address current health needs and focus on the care of underserved populations.

- a) Support should include establishing a central (HRSA) data repository of Title VII grantees and matriculants to aid in the dissemination of evaluation tools among Title VII grantees. HRSA should also provide additional funding to grantees to monitor long-term outcomes of trainees, including trainees' career selection, retention in primary care, and choice to work in underserved areas. In addition, HRSA should provide support for demonstration projects on trainee tracking systems.
- b) Evaluation tools must also be developed to measure faculty retention, the number of mentoring relationships, faculty perceptions regarding the success of mentoring efforts, faculty retention and promotion, and the number of established linkages between Title VII, section 747 and 748 programs and community health centers.

Problem/Opportunity for Improvement

Measurement of the effectiveness of Title VII, section 747 and 748 programs is critical to demonstrate the strategic importance of these programs in developing the health care provider workforce, as well as identifying and disseminating best practices. Emphasis should be given to evaluating near-term outputs and long-term outcomes that are important to program stakeholders. However, long-term patient outcomes can take years to measure, and external factors may

prohibit a program from having total control over outcomes. Therefore, evaluation should focus on the training-related outcomes that are central to the program's mission.

Challenges exist in evaluating Title VII, section 747 and 748 programs. First, there are a number of complementary programs within HRSA, which may create difficulty in isolating and measuring the specific impact of Title VII, section 747 and 748 programs. Second, program evaluation can also be resource-intensive, and the activities necessary for proper evaluation can place a significant burden on grantees. Third, once trainees have left grantee institutions, it is expensive and difficult to track where they are practicing and the types of patients they are serving. Finally, the ability to define longitudinal program outcome measures is sometimes complicated by changes in legislation.

A central data repository of Title VII grantees and matriculants would help address some of the challenges involved in tracking trainees. As part of developing this repository, standardized data collection procedures should be developed that minimize the data collection burden. Standardized collection procedures would facilitate uniformity in data that would enable better comparisons and aggregation. Support for demonstration projects that provide trainee tracking and monitoring would facilitate the institution of these data collection standards. This data repository would reduce the need for grantees to set up their own tracking infrastructure. It would also serve as a resource for researchers, educators, and physicians, as well as those conducting evaluations of grant programs. To complement this support, additional funding should be provided to grantees to collect information on outcomes. This additional support is important for grantees who typically have limited budgets for evaluation.

Examples of areas for trainee assessment would include: attitudes, both pre-professional and professional, regarding the (a) care of underserved populations, (b) ability to recognize and appreciate the connection between patients' social circumstances and capacity to address their own health issues, and (c) ability to integrate knowledge about the social and behavioral determinants of health into clinical decision making.

Benefits of Adopting this Recommendation

- Results of outcome evaluations would communicate the importance of Title VII, section 747 and 748 programs.
- A central data repository of Title VII grantees and matriculants, associated data collection procedures, and funding would enable better data collection by grantees.

5. Recruitment Strategies

To enable support for recruitment strategies for future primary care medical and dental providers, a revised reimbursement model should acknowledge the value of coordinated care that emphasizes prevention and provides chronic care management. The Advisory Committee also supports mechanisms of practice transformation and physician payment to reduce salary disparities between primary care medical and dental providers and their subspecialty colleagues.

Problem/Opportunity for Improvement

As noted, fewer and fewer medical trainees are choosing to enter primary care. The only exception to this trend is pediatrics, where 10-12 percent of graduating medical trainees has selected pediatric residencies in the past 10-15 years, and residencies in primary care pediatrics far exceed pediatric subspecialties, many of which are experiencing shortages (Felice, 2011). - COGME's 20th report noted that medical trainees choose specialties because of fellowship training opportunities, the influence of mentors, and the lifestyle offered by a specialty practice (COGME, 2010). In this regard, adult primary care does not appear as an attractive choice. Medical trainees witness the challenges and dissatisfactions that adult primary care preceptors and faculty members experience such as (a) inadequate compensation for patient preventive services; and (b) inadequate time for patients, many aged, with chronic or complex conditions that are discharged from hospitals in a tenuous health state (COGME, 2010). In a study of the working conditions of family practitioners and general internists, researchers found that 53.1 percent of physicians reported time pressure during office visits, 48.1 percent noted that work pace was chaotic, 78.4 percent reported low control over their work, and 26.5 percent noted burnout towards their practice (Linzer et al., 2009). The issues surrounding physician payment and practice transformation must be addressed to develop viable recruitment strategies and present primary care specialties as an attractive and rewarding option for future physicians.

Efforts to redesign the practice environment, such as emphasis on the Patient-Centered Health Home, could be an opportunity to create healthier work environments, improve provider satisfaction, and reduce stress and burnout. Organizations that incorporate recruitment strategies that are sensitive to the demands of work/life balance may be better able to recruit and retain primary care physicians (Linzer et al., 2009).

Lower income is significant because of the high debt burden of medical, physician assistant, and dental trainees, who fund a large proportion of educational expenses through loans. For example, Figure 2 shows that in 2010 the mean debt for medical trainees graduating from public osteopathic schools was \$190,073 and from private osteopathic schools \$221,675. For those graduating from public allopathic schools the mean debt was \$148,704 and from private allopathic schools \$174,387 (AACOM, email communication, May 16, 2011; AAMC, 2011). As noted in Figure 3, the median class debt of family medicine residency graduates for 2010 was \$239,899 (AAFP, 2010). Figure 4 illustrates that, in 2009, the average debt for dental trainees graduating from public dental schools was \$155,407 and from private dental schools \$215,330 (American Dental Educational Association, 2009).

Note 1:

Source for M.D. data: Association of American Medical Colleges (AAMC) (2011). *AAMC data book: Medical schools and teaching hospitals by the numbers 2011*. Retrieved from <https://www.aamc.org/data/databook/>. Refer to Table E4.

Source for D.O. data: American Association of Colleges of Osteopathic Medicine (AACOM) (2011). Retrieved from Dr. S. Shannon, email communication, May 16, 2011.

Note 2: Figure 2 caption denotes that this table depicts the self-reported mean educational debt of graduating seniors that reported educational debt.

Figure 3: Primary Care Residency Graduates – Total Educational Debt, 2010

Level of Debt 2010	
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Level of Debt 2010	
None	8.7%
Less than \$50,000	8.7%
\$50,000 – 99,999	5.3%
\$100,000 – 149,999	5.6%
\$150,000 – 199,999	10.0%
\$200,000 – 249,999	14.6%
\$250,000 or more	47.0%

N = 321

Class median = \$239,899

Percentages are adjusted for non response.

Note:

Source: American Academy of Family Physicians (AAFP) (2011). *Annual residency completion survey 2010*. Retrieved from <http://www.aafp.org/online/en/home/aboutus/specialty/facts/26.html>. Refer to Table 26.

Note:

Source: American Dental Educational Association (ADEA) (2009). *Average debt among graduating students with debt by type of school, 1996–2009*. Retrieved from <http://www.adea.org/publications/tde/Documents/Average%20Debt%20Among%20Graduating%20Students%20with%20Debt%20by%20Type%20of%20School.pdf>

Similarly, Figure 5 depicts the two-decade rise in mean educational cost for physician assistants, from \$12,500 in 1990 to \$66,871 in 2008, with the percentage of trainees requiring financial aid rising from 71 percent to 92 percent during this eighteen-year time period (Physician Assistant Education Association, 2011). This increase in cost and required financial aid undoubtedly contributes to the decrease of physician assistants working in primary care.

Figure 5: Mean Educational Cost and Financial Aid for Physician Assistants

Resident – Non-Resident % of Class

Year	Mean Education Cost	Financial Aid
1990	\$12,500 – 16,500	71
2000	\$32,700 – 39,300	86
2008	\$56,220 – 66,871	92

Note 1:

Source: Physician Assistant Education Association (PAEA). (2010). *Twenty-Fifth Annual Report on Physician Assistant Educational Programs in the United States*. Retrieved from <http://www.paeaonline.org/index.php?ht=a/GetDocumentAction/i/107753>. Refer to Table B.

Note 2: Mean educational cost denotes tuition plus incidental costs such as books, etc.

The increase in mean educational debt and educational cost and lower compensation contribute to the decreasing trainee interest in primary care professions. In a review of the literature, Kutob and colleagues (2003) concluded that trainees who decided to reject primary care were concerned with low income, low prestige, and the wide breadth of knowledge required to practice in this field (Kutob, Senf, & Campos-Outcalt, 2003). Morra and colleagues (2009) found that most medical trainees agreed that family physicians are paid too little. They concluded that financial considerations may be an important driver in the declining interest in

family medicine (Morra, Regehr, & Ginsburg, 2009).

With high debt burdens at graduation, jobs in adult medicine specialty fields are more attractive because specialty fields offer nearly twice as much compensation as adult primary care positions. As shown in Figure 6, overall median income of adult primary care physicians in 2009 was only 59 percent of the median income of specialty physicians (Medical Group Management Association, 2010). An important challenge in improving mechanisms of provider payment is the disparity in income between providers in primary care and those in specialties. A revised reimbursement model should acknowledge the value of coordinated care that emphasizes prevention and provides chronic care management.

Figure 6: Physician Compensation – Primary Care vs. Specialists

Practice Type 2009	
Family Practice (without OB)	\$183,999
Internal Medicine *	\$197,080
Pediatric/Adolescent Medicine *	\$191,401
All Primary Care	\$191,401
Dermatology *	\$413,657
Emergency Medicine	\$262,475
Gastroenterology	\$465,509
Obstetrics/Gynecology	\$282,645
Orthopedic Surgery *	\$496,264
Psychiatry *	\$193,205
Surgery: General	\$336,084
Urology	\$390,678
All Specialists	\$325,916
All Non-physician Providers	\$94,441

Note 1:

Source: Medical Group Management Association. (2010). *Data from physician compensation and production survey: 2010 report based on 2009 data*. Retrieved from <http://www.mgma.com/Store/ProductDetails.aspx?id=38993>

Note 2: Asterisk represents specialties that are combined with subspecialties. For example, dermatology includes dermatology; dermatopathology; dermatology: Mohs surgery, etc.

Sandy and colleagues (2009) recommended revision in payment policies to reduce the disparity between primary care and specialist compensation, advocating that health care reimbursement rates should be commensurate with the value of care provided to individual and population health through patient engagement; care coordination; and comprehensive, personalized longitudinal care rather than procedural volume. They also urged congressional action to recalibrate the Resource-Based Relative Value Scale (RBRVS) fee structure for Medicare and Medicaid as well as RBRVS adoption by private insurers. In addition, Sandy and colleagues recommended the development of a blended payment system that has proper incentives to improve health care outcomes and maximize efficiency. This system should place less emphasis on fee-for-service and more emphasis on pay-for-performance and care coordination (Sandy, Bodenheimer, Pawlson, & Starfield, 2009).

Benefits of Adopting this Recommendation

- Reduction of the disparity in compensation between primary care providers and specialists may provide incentives for new physicians and dentists to select primary care fields.
- Reformation of payment policies to facilitate improved practice models will improve work/life balance for those working in primary care.

6. Care for an Expanded Number of Vulnerable Populations

The Advisory Committee endorses the definition of vulnerable populations, described in the Affordable Care Act of 2010 as children, older adults, homeless individuals, victims of abuse or trauma, and individuals with HIV/AIDS, disabilities, mental health, or substance-related issues. The Advisory Committee believes underserved groups, including low-income, low-education, and racial ethnic minorities, should be added to the list. Programs should prepare trainees to provide care for this expanded number of vulnerable groups.

Problem/Opportunity for Improvement

Providing an adequate number of trained primary care physicians, physician assistants, and dentists to serve vulnerable populations has been a core mission for Title VII, section 747 and 748 funded programs since their inception. Programs should prepare trainees to provide care for vulnerable populations in high-quality, culturally-competent environments.

Vulnerable populations often have difficulty obtaining health care due to factors such as low income, lack of health insurance, maldistribution of providers, and an inadequate number of providers trained to address the challenges of vulnerable populations. For instance, one recent study revealed that only 36.5 percent of children under Medicaid obtained a dental appointment for an acute oral injury, versus 95.4 percent with private insurance (Bisgaier, Cutts, Edelstein, & Rhodes, 2011). Furthermore, advancements in medical technology and treatment interventions have increased longevity for many persons with developmental disabilities. As a result, there is a growing population of vulnerable adult and pediatric patients with developmental and intellectual disabilities who are unable to find appropriate health care providers who have the expertise to care for their special needs.

Providers must acquire an expanded set of skills in order to address the complex needs of vulnerable populations. Among these skills are (a) identifying factors that contribute to vulnerability; (b) working with patient and community differences in culture, class, race, and ethnicity; and (c) caring for persons with intellectual and physical disabilities. Medical, physician assistant, and dental trainees must be prepared to assess vulnerability among patients and provide high-quality, culturally-competent care. Appropriate training through Title VII programs can help primary care providers improve their confidence and competence in working with vulnerable populations.

Primary care provider maldistribution has been a persistent public policy problem across our Nation. Numerous interventions have had some impact in mitigating this problem, yet the National Health Service Corps estimates that 50 million Americans still live in health

professional shortage areas.

Discrepancies in income between primary care and other medical specialties, as well as lifestyle issues, make it difficult to entice trainees to practice in underserved areas where the main focus is usually on primary care. The reluctance to practice in underserved locations can be mitigated to an extent by targeting Federal programs to offer loan repayment and other lifestyle incentives for those working with the vulnerable and underserved.

Finally, the Advisory Committee believes that several high-risk, vulnerable populations, currently not recognized, should be included by Federal agencies as medically underserved. These vulnerable populations include some groups that have been recognized as vulnerable in the past, such as racial and ethnic minorities, those with low socioeconomic status, and those with low levels of education.

Benefits of Adopting this Recommendation

- Financial incentives could counteract the disincentives for going into primary care, such as high levels of educational debt and disparities in income.
- Providers who acquire appropriate skills are better equipped to provide high-quality care to vulnerable populations.

7. Competencies for Primary Care Practice

The Advisory Committee recommends funding for training innovations that focus on competencies needed for primary care practice, including those related to population health, a public health perspective in clinical decision making, systems practice, and interprofessional collaboration.

Problem/Opportunity for Improvement

New challenges to the health care system are arising from significant societal and demographic changes such as globalization, scientific and technological advances, and an aging population. Globalization results in an increase in travel and a higher risk of disease transmission, including drug-resistant strains of microbes and viruses that cause disease. Scientific and technological advances can cause degradation of the environment and exposure to toxins, and an aging population can experience a corresponding increase in multiple chronic conditions.

Most efforts to advance health care in the United States have been focused on the treatment of acute disease in individuals rather than the prevention of disease, and investments to build population health capacity have lagged behind (*Who Will Keep the Public Healthy?* IOM, 2003). Currently, our Nation's health is threatened by several preventable sources such as (a) poor oral health care and cavity formation; (b) chronic diseases such as diabetes, asthma, hypertension and obesity; and (c) infectious diseases such as HIV/AIDS, polio, pertussis, tuberculosis, and influenza. Innovations in improving primary and secondary prevention of these diseases should be supported, focusing on the importance of providing services through a Patient-Centered Health Home. Interprofessional collaboration through physician or dentist-led teams enables a Patient-Centered Health Home to provide high-quality primary care, at lower cost, through a

coordinated system of health care (ACTPCMD, 2010). For instance, improved outcomes result from integrated in-home support for diabetic patients as well as regular visits to a provider (Carter, Nunlee-Bland, & Callender, 2011). Preventive dental treatment by physician-lead interprofessional teams results in fewer cavities (Pahel, Rozier, Stearns, & Quiñonez, 2011). These examples illustrate that a Patient-Centered Health Home can offer significant advantages in caring for underserved populations (ACTPCMD, 2010).

Developing public health programs for the treatment of infectious diseases, such as tuberculosis, results in improved health outcomes (Moonan et al., 2011; Sia & Wieland, 2011). Ensuring that providers are equipped to participate in a Patient-Centered Health Home and respond to population health needs necessitates acquiring new competencies in population health, systems practice, and interprofessional collaboration. Through population-based, system-level practice, interventions can be implemented within organizations and their infrastructure, enabling policies to be adopted that improve the overall health of a population. Training will facilitate providers' effectiveness in situations that require prevention and treatment.

Benefits of Adopting this Recommendation

- Providers will be better equipped to implement systemic changes that can benefit a large number of individuals within a targeted population.
- Providers will be better equipped to respond to emerging health threats.

8. Dental Faculty Programs

The Advisory Committee recommends establishing faculty development programs under Title VII, section 748 for primary care dental faculty who will serve as role models in educating trainees in primary care programs, including the development of new compensation models to encourage faculty to stay as instructors in primary dental programs.

Problem/Opportunity for Improvement

The dental profession is facing a serious shortage of full-time dental faculty. Schools and residency programs are finding and retaining fewer individuals with the skills to educate dental trainees. At the 56 dental schools in the United States, there were 275 vacant budgeted faculty positions in 2004–05 (Trower, 2007). In addition, a significant proportion of dental school faculty is over the age of fifty, and departures due to retirement can deplete the ranks of dental faculty (Schenkein & Best, 2001). Most new recruits come from private practice, and many of them are joining academia after a 25- or 30-year career in private practice (Trower, 2007). These shortages are likely to continue due to (a) a growing gap between private practice and faculty salaries, (b) trainee debt and its affect on postgraduate education opportunities, (c) acceleration of dental faculty retirements, and (d) additional budget cuts. All of these factors may further exacerbate the situation (Sinkford, Valachovic, & Harrison, 2004).

One of the most significant reasons for the decline in dental faculty is the growing discrepancy between faculty and private practice incomes. In a survey of 451 full-time faculty members, salary topped the list of negative aspects of the academic dental work environment (Froeschle & Sinkford, 2009). Other major reasons cited were lack of facilities, budget cuts, and lack of time.

As mentioned, the gap between private dental practice and faculty income continues to grow (Haden, Weaver, & Valachovic, 2002)

Note:

Source: Trower, C. A. (2007). Making academic dentistry more attractive to new teachers–scholars. *Journal of Dental Education*, 71(5), 601–605. Refer to Figure 1.

With the current and predicted shortage of dental faculty, the need to develop new compensation models to encourage faculty retention in primary care training programs becomes more important. Options may include examining ways in which viable practice opportunities and research incentives can supplement base salaries. An example might include billing for services in which faculty supervise trainees. Dental trainees spend two or more years of their training performing procedures, and their school during that time collects revenue from these procedures (Hupp, 2006). Another option would be to offer dental faculty a more flexible work schedule that may offset salary concerns.

As discussed, primary care faculty who are satisfied in their careers make better role models and mentors for trainees considering careers in primary care. Infrastructure is required to support them and prevent burnout. Mentors who are well supported are more likely to serve as positive role models for trainees.

Benefits of Adopting this Recommendation

- Improved compensation leads to higher career satisfaction and better faculty recruitment and retention.
- Reducing the compensation disparity between private and academic primary care careers will provide incentives for dentists to choose academic positions.
- Faculty who are satisfied with their careers will serve as better role models for their trainees.

9. Dental Applications from Underserved and Rural Areas

The Advisory Committee recommends that Title VII, section 748 training grants give emphasis to applications that target recruitment and admission of trainees from underserved and rural areas, with special focus on underrepresented minorities. In addition, grants should facilitate creating innovative trainee recruitment and admission programs to target trainees who have demonstrated a commitment to community service.

Problem/Opportunity for Improvement

Millions of Americans have insufficient access to dental care. According to the National Center for Health Statistics, less than 50 percent of the poor in this country visited a dentist in the previous year (National Center for Health Statistics, 2004). A significant cause for this lack of access is the limited number of dentists who are willing to practice in HPSAs (Mentasti & Thibodeau, 2008). For example, 20 percent of the U.S. population resides in rural areas, but only 7.65 percent of dentists practice in rural areas (McFarland, Reinhardt, & Yaseen, 2010).

Research shows that the most likely site for a dentist to begin practice is the community or region in which he or she was raised or attended school (Brown & Meskin, 2004; Graham,

1977). This evidence supports the strategy of targeting an applicant pool that will likely practice in an underserved area upon graduation. One approach would be for Title VII, section 748 training grants to give emphasis to applications that target recruiting of trainees from underserved and rural areas, with a special focus on underrepresented minorities. This effort might include high schools and colleges that foster an interest in dentistry through coordinated and organized efforts such as pre-dental clubs or science honor societies (Mentasti, 2005). Also, grantees might be encouraged to provide shadowing experiences and assist trainees in becoming qualified and competitive dental school applicants (Mentasti, 2006).

Benefits of Adopting this Recommendation

- Pre-professional programs could recruit trainees who might not otherwise apply to professional school.
- Recruitment of trainees from underserved areas will increase the number of dentists likely to practice in those areas.

10. Public Dentistry Practice

The Advisory Committee recommends the creation of Title VII, section 748 grants for infrastructure development of programs for both faculty and dental trainees to prepare for careers in the Nation's increasing number of health centers and safety net programs.

Problem/Opportunity for Improvement

Overwhelmingly, dentists prefer and seek private practice as a desired career preference. According to the National Academy for State Health Policy, more than 92 percent of dentists are currently working in private practice and 79 percent are sole proprietors (Gehshan & Wyatt, 2007). Both dental education and continuing education programs focus on training and orienting trainees toward entering private practice. To meet the workforce needs of effective health centers and safety net programs, faculty and trainees must have exposure to these types of programs so trainees can demonstrate a minimal level of competencies and experience career modeling in such environments. This approach will ensure that trainees are prepared to potentially manage clinical care in health centers and safety net programs as well as engage in private practice.

The dynamics of the private practice market have such an influence over the policies of the American Dental Association that the organization does not forecast a shortage of dentists; however, other organizations do forecast shortages. For example, the Bureau of Health Professions estimated that between 6,610 and 9,228 dentists are needed to serve 3,329 designated shortage areas, in which nearly 31 million underserved people reside (Gehshan & Wyatt, 2007). Such shortages and dental provider preferences have a significantly negative impact on the Nation's growing dependence upon safety net programs. Health centers are experiencing increasing demands on their dental services, expanding from 1.3 million patients in 2000 to over 2.3 million in 2005 (Ruddy, 2007). Yet, according to the National Academy for State Health Policy, shortages in the supply of dentists limit health centers' capacity to provide dental care. According to a 2004 survey, 48 percent of health centers reported having a dentist

vacancy, and 12 percent reported multiple vacancies. Nearly 18 percent reported vacancies lasting over one year (Snyder & Gehshan, 2008). This problem is even more keenly experienced in rural locations, where up to 32.6 percent report ongoing vacancies (WWAMI Rural Health Center, 2005).

Even if all dental vacancies are filled, the question remains whether dentists are prepared to work within the Nation's health centers. In a report on the status of the dental safety net, one in six 2008 graduates (16.5 percent) felt unprepared to care for a diverse population and one in five (22 percent) felt unprepared for adapting treatment plans for low income populations. Surprisingly, one in three (37.7 percent) also felt unprepared to provide care for the disabled (Edelstein, 2010). Clearly, the current dental training system fails to provide sufficient and necessary exposure, in terms of diversity and treatment intensity, in order to serve an underserved population with long-standing and unmet medical and dental needs. In addition, dentistry fails to meet the needs of low income pregnant women. While new studies indicate the relative safety of providing dental treatment to pregnant women, and the negative impact of untreated dental disease on pregnancy and health, dental professions are still reluctant to treat this population (Huebner, Milgrom, Conrad, & Lee, 2009).

These challenges, plus a program's focus on private practice, adversely affect health centers and cause workforce issues to become a key concern. One-quarter to one-third of dentists successfully recruited to work within health centers report that they plan to leave for reasons other than retirement. As a result, one-third of all health centers are actively recruiting dentists at any given time (Edelstein, 2010).

The education and supply of the dental workforce is not keeping pace with the growing need. The future of the safety net will depend upon building adequate provider numbers and training providers to perform in diverse environments, with the ability to provide care for varying levels of disease complications. These providers must have the skills to adapt treatment planning to the individual and to the environment as well as the ability to work as part of an interdisciplinary team. Title VII, section 748 training grants can be provided to assist in developing such innovative dental training programs. These programs will require mentoring by current safety net providers and role modeling in dental careers outside of private practice to ensure effectiveness (Kunzel et al., 2010).

Title VII, section 748 grants should encourage skill programs in public practice administration, to provide the knowledge and competencies necessary to operate a successful public dental practice within the fiscal environment of federally-funded health centers. While clinical competencies are important, dentists must also possess sufficient administrative competencies for public practice, to ensure that community safety net programs are fiscally sound and can continue ongoing operations.

Benefits of Adopting this Recommendation

- Competencies will be developed in the dental workforce to address the dental needs of a diverse population with varying levels of disease and health literacy.
- The current system of educating dentists will be updated to include working outside of

private practice and participating as part of an interdisciplinary team.

- Management tools and competencies will be developed to ensure success in providing dental care in challenging health center fiscal environments.
- Dentists will be prepared to have successful, satisfying, and rewarding careers within the Nation's growing safety net system.

11. Dental Workforce Models

The Advisory Committee does not endorse any particular dental workforce model, but recognizes that a variety of models need to be studied. Title VII, section 748 grants should evaluate the outcome measures of various dental workforce models in terms of their effect on health outcomes, fiscal efficiencies, and effective access within the national safety net for Medicaid recipients and the uninsured.

Problem/Opportunity for Improvement

A dental workforce insufficiency is an ongoing problem for the Nation's safety net programs and underserved areas. Health centers are increasingly seen as part of the solution for access to care for the underserved, and face expansion pressures to build more capacity to meet this challenge. New access points to health centers are required to provide primary dental services, but recruitment and retention of dentists to work in health centers remain a serious challenge (Russell, 2008). As noted by Edelstein, the safety net system is a composite of all places, practices, providers, and programs that deliver dental services to disenfranchised people, yet 92 percent of U.S. dentists are in private practices (Edelstein, 2010). According to a 2009 survey, less than 50 percent of U.S. dentists in 25 out of 39 reported states treated any Medicaid patients during the previous year (U.S. Government Accountability Office, 2010).

Reports by The Pew Center on the States (2010) suggest that the addition of mid-level providers (e.g., dental hygienists) to the team can reduce costs and improve the profitability of existing practices. Further evidence and adaptable modeling are needed to create a workforce method that enables health centers and other safety net programs to build sustainable dental programs, within limited budgets, that improve patient health outcomes. The future will require a different training model for dentists that develops highly skilled scientists and clinicians to address the diversity, preventive needs, and advanced disease manifestations that impact underserved communities. The reduced capacity of the dental education system and declining dentist-to-population ratios have resulted in structural shortages that further compound the low participation rates by dentists in Medicaid and the Children's Health Insurance Program (Gehshan, Snyder, & Paradise, 2008).

According to Gehshan and colleagues (2008), strategies to tackle such large structural needs will require different components. This new paradigm should include building systems of oral health care that support a disease management approach that closely aligns service capacity and content of care with disease burden. One aspect of this system would allow emerging highly-trained dentists, as scientists and surgeons, to delegate less complex procedures to allied dental personnel. This would expand practitioner productivity and increase practice capacity to deliver

care (Brown, 2001). Examination of various provider models would contribute significantly toward an expansion in productivity by streamlining efforts to those that prove most effective. A broad array of issues and challenges must be addressed, including expanding the scope of practice for the existing allied dental workforce and integrating non-oral health providers into the dental care system (IOM, 2009). Collaborative models of practice present a promising avenue for needed care where a mix of economic, demographic, and geographic barriers to care require flexible approaches to improve oral health (Skillman, Doescher, Mouradian, & Brunson, 2010).

The Indian Health Service introduced the first U.S. working model of dental mid-level providers in 2003, under a federal law known as the Dental Health Aid Therapist. The original cohort was trained in New Zealand, due to a lack of U.S. programs at the time. Since then, two independent studies have been performed, evaluating the skill and safety in expanding minor dental surgical procedures to these non-dentist providers. A pilot study in 2008 did not reveal any significant evidence that irreversible dental treatment provided by a Dental Health Aid Therapist differed from similar procedures performed by dentists (Bolin, 2008).

A second and more comprehensive study, sponsored by the W.K. Kellogg Foundation, Rasmussen Foundation, and Bethel Community Services Foundation, was conducted by RTI International in 2008. Again, results showed little difference in the quality of treatment between dentists and Dental Health Aid Therapists when therapists performed within their scope of practice limitation (Wetterhall, Bader, Burrus, Lee, & Shugars, 2010). Neither study had the opportunity nor the population to evaluate improvement in health outcomes, or whether such practice models could retain or sustain their providers without subsidy. In 2009, Minnesota became the first state to enact a statute that approved the first dental therapist training program and a set of licensing guidelines (Glasrud, Embertson, Day, & Diercks, 2009). The idea for developing new mid-level dental provider models is quickly expanding among the states. Foundations such as The Pew Charitable Trusts and W.K. Kellogg Foundation have collaborated to encourage states to seek new workforce models as part of addressing oral health workforce shortages.

Early support for and evaluation of a model that delivers the excellent quality of care experienced by less vulnerable populations in the U.S. would allow diverse private and federal funds to focus on the most effective, efficient, and sustainable model. Title VII, section 748 grants could contribute significantly toward the assessment of dental workforce models, greatly expanding the capacity of the safety net and improving the ability of public dental coverage programs like Medicaid to leverage more access to needed dental care.

Benefits of Adopting this Recommendation

- Increased flexibility and diversity in the dental workforce will address multiple barriers and increase access to dental care for the underserved.
- The addition of new workforce models will extend the ability of the current dentist-led delivery system to meet the needs of underserved populations with less costly

interventions in cases requiring minor dental treatment.

- An objective evaluation of existing programs will measure improvement in defined access deficiencies, changes in health outcomes, and sustainability of models.

Conclusion

Priming the pump of primary care is paramount in the improvement of the health of all patients. In order to reach the goal of attaining accessible, high-quality, and affordable health care for all citizens and eliminating health care disparities, we must ensure an appropriately trained and distributed primary care workforce. To achieve this goal, several steps, supported by HRSA, are necessary. The Advisory Committee feels that the recommendations in this report are essential to accomplishing our vision to provide medical and dental care within a Patient-Centered Health Home. We have outlined several factors which will be instrumental in moving forward, including provider support for physicians, physician assistants, and dentists at all levels of training and health care delivery.

We feel that first and foremost, it is necessary to support the primary care pipeline with programs that identify individuals who have demonstrated a dedication to primary care during pre-professional and pre-clinical settings. Through the admissions process to professional medical, physician assistant, and dental programs, it is important to refine policies to recruit and retain primary care-focused individuals. Once in professional programs, support should be given to dedicated mentoring and role-modeling by faculty to stimulate and nurture future primary care physicians. Through this process, it is essential to train in interprofessional settings and to focus on the Patient-Centered Health Home and medical-dental teams. Support should also be given to evaluating the effectiveness of these changes in the retention of primary care providers and in patient outcomes.

It is important to note that changes to the practice environment should be supported, so that trainees can look forward to improvements in terms of work/life balance and appropriate compensation for coordinating preventive services and care for those with chronic diseases. Attention should be paid to population health and care of vulnerable populations as areas ripe for new innovations in team-based approaches. Specifically, the development of dental safety nets and support for retaining dental faculty are essential in improving primary care.

It is our belief that support for primary care through these recommendations is essential to creating a strong health care workforce and bodes well for the health of all patients.

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