UnitedHealth Center for
Health Reform & Modernization

ADVANCING PRIMARY CARE DELIVERY

Practical, Proven, and Scalable Approaches

September 2014

TABLE OF CONTENTS

EXECUTIVE SUMMARY

A snapshot of the U.S. primary care system

Primary care represents an estimated 6 percent to 8 percent of national health care spending — approximately $200 to $250 billion annually.[1]

Primary care visits account for 55 percent of the 1 billion physician office visits each year in the United States.[2] The Affordable Care Act could generate an additional 25 million primary care visits annually through:[3]

- Increases in insurance coverage;
- Requirements for coverage of certain essential health benefits; and
- Elimination of copayments for preventive services.

Assessing value and capacity

Primary care is central to effectively treating patients. A higher supply of primary care physicians is related to lower rates of mortality and more effective delivery of preventive care.[4] High rates of avoidable visits to emergency departments and avoidable hospitalizations are a sign that many patients could be treated more appropriately and cost effectively in a primary care setting. An estimated 70 percent of emergency department visits by commercially insured patients in the United States are for non-emergencies.[5]

An analysis by the UnitedHealth Center for Health Reform & Modernization and Optum Labs underscores that primary care physicians contribute to high-quality, cost-effective care. In local health care markets with a greater supply of primary care physicians, there are lower rates of avoidable hospital admissions and emergency department visits, as well as less use of costly high-technology diagnostic imaging when traditional imaging is often just as effective.

Approximately 50 million Americans live in areas with an under-supply of primary care physicians.[6] Most of these areas are rural. Notably, the percentages of nurse practitioners (15 percent) and physician assistants (17 percent) who practice in rural areas are greater than the percentage of physicians (10 percent) who practice in rural areas.[7]

An analysis by the UnitedHealth Center for Health Reform & Modernization and Optum Labs shows that socioeconomic factors help explain geographic variation in primary care physician supply.

- **Primary care physicians are concentrated in areas with higher median household incomes.** In the 10 percent of local health care markets with the lowest concentration of primary care physicians, the median household income was $46,000. In the 10 percent with the highest concentration, it was $66,000.
- **Primary care physicians are concentrated where residents — and potential patients — are more likely to have insurance coverage.** In the 10 percent of local markets with the lowest concentration of primary care physicians per capita, the uninsured rate for the non-elderly was 17 percent; in those with the highest, it was 11 percent.
- **There is a higher concentration of non-physician primary care providers — nurse practitioners (NPs) and physician assistants (PAs) — in areas with lower median household incomes and higher rates of uninsured residents.** In the 10 percent of local markets with the lowest concentration of primary care physicians, the concentration of NPs and PAs was highest, and there were approximately equal numbers of physician and non-physician providers.

The supply of primary care physicians is concentrated away from rural areas, away from lower-income communities, and away from the uninsured. Therefore, increasing physician supply may not be enough to effectively address unmet demand for primary care services in all areas of the country, in part because lower reimbursement rates and salaries in primary care practice may help steer some medical graduates with substantial student debt toward higher-paying specialties. Increased roles for NPs and PAs would add to the system's overall primary care capacity, and could help target capacity to areas where there are fewer primary care physicians.

Building blocks for bolstering capacity

Building blocks for enhancing capacity and improving primary care service delivery include:

- **Leveraging a diverse workforce.** Advancing effective roles for NPs and PAs depends on greater use of evidence-based guidelines, rigorous quality measurement frameworks, and quality improvement initiatives for non-physician providers. A significant barrier to achieving more dramatic and rapid progress is payment policy. Medicare and Medicaid generally reimburse less for services delivered by NPs and PAs than for the same services when performed by physicians.
- **Assembling multi-disciplinary care teams.** A primary care physician with a panel of 2,000 patients would need to spend an estimated 17.4 hours per day to provide recommended preventive, chronic, and acute care — and many primary care physicians have larger panels.[8] Assembling multi-disciplinary care teams can leverage additional capacity to help practices see more patients.
- **Utilizing health information technology (HIT).** HIT, including electronic health records (EHRs) and interoperable data exchange, allows primary care practices to organize and disseminate information across the delivery system in real time — improving care coordination, increasing quality, and lowering costs.[9] Broader implementation of HIT can increase systemwide capacity to meet increased demand, improving access to primary care.[10]

Advanced service delivery and payment models

Private and public payers continue to work with providers to implement patient-centered medical homes (PCMHs) and accountable care organizations (ACOs). These approaches show great promise; however, their success has not been uniform. Medical home and accountable care models can advance the Triple Aim goals of improving quality and the patient experience of care, improving population health, and reducing the cost of care — provided they are well designed and implemented. One key to success is a financial model that moves past fee-for-service reimbursement by rewarding value over volume.

- Evidence from UnitedHealthcare's medical home programs in four states shows average third-year net savings of 6.2 percent of medical costs, resulting in a return on investment of 6 to 1.
- WESTMED's commercial ACO improved care on nine of 10 health quality metrics, while achieving an 8 percent reduction in emergency department utilization, a 5 percent decrease in hospital inpatient costs, and a 1.3 percent reduction in costs per member in one year.
- Monarch HealthCare was the top performing of 32 Medicare Pioneer ACOs on three measures of quality and the second ranked Pioneer ACO in achieved cost savings. It reduced Medicare spending by 5.4 percent in 2012 from the 2011 baseline for attributed beneficiaries, compared to a 1.1 percent increase for a reference cohort.

These successful models all embraced payment reforms that move beyond fee-for-service reimbursement. Under fee-for-service, physicians are paid for the volume and complexity of care delivered. This approach incents the delivery of a greater quantity and higher intensity of services; it does not encourage better quality care.[11] As much as half of wasteful health care spending results from failures of care delivery and care coordination, as well as overtreatment — all of which could be improved by moving away from the fee-for-service reimbursement model.[12]

Models that delink payment from units of primary care, and instead prioritize value, include:

- Performance-based bonuses as modifications to traditional fee-for-service payments;
- Risk-adjusted monthly payments for primary care services;
- Gain-sharing through shared savings, without risk; and
- Risk-adjusted capitation payments to group practices and integrated delivery systems.

Approaches to expand access and target capacity

In addition to changing service delivery and payment models within primary care practices, there are a range of proven and scalable approaches to expand and better target primary care capacity:

- **Leveraging the retail health infrastructure.** Clinics in large retail outlets hold the potential for large-scale innovation in primary care. Between 2007 and 2012, the volume of retail clinic visits grew more than six-fold, from 1.5 million to 10 million annually.[13] Close to half of retail clinic visits take place when physician offices are closed.[14] Evidence indicates that the quality and cost of services provided by retail clinics offer significant value, expanding access to primary and preventive care and reducing unnecessary utilization of costly services, such as hospital admissions.
- **Reaching patients where they live.** Delivering primary care and preventive services to individuals in their homes is an effective approach to improving access and care delivery. A key advantage of conducting clinical visits in the home is the review of environmental and social conditions, which provides valuable information and context to inform an individual's treatment plan. Optum's HouseCalls, a care management program that provides annual in-home clinical visits, employs more than 1,200 licensed physicians and nurse practitioners. In 2013, HouseCalls conducted approximately 670,000 visits in 37 states.
- **Utilizing group visits.** Group visits represent an evolving approach for improving access to primary care. Under this model, patients have both private examinations and group education sessions. One advantage of group models is that they are an efficient use of provider time compared to individual care.[15] Shared medical visits can decrease emergency department and specialty visits, reduce hospital admissions, increase patient satisfaction, and improve patient outcomes.[16]
- **Engaging complex patients.** Making the most effective use of primary care services and better leveraging capacity to reduce overall spending requires a greater focus on complex and costly patients. In a single year, 5 percent of the population accounts for 50 percent of health care costs; and more than one in three (38 percent) of these "super-utilizers" remains in the most costly 5 percent of people the following year.[17] Targeting complex patients requires analytic models that map patient clinical characteristics to utilization levels and payment models that support resource-intensive targeting and care management efforts.

Conclusion

There is no single set of clinical, organizational, and financial models that successfully expands primary care capacity and improves service delivery. **The approaches examined in this report offer multiple complementary pathways that can be tailored to local market conditions and policy environments. When implemented successfully, their common threads include focusing on the patient; the quality of service delivery, rather than who is delivering care and in what setting; and paying for value.** These approaches challenge longstanding assumptions about the scale, pace, and intensity of change that are both possible and necessary.

Championing, deploying, and implementing these approaches — effectively and at scale — ultimately will require sustained efforts from policymakers, regulators, health plans, providers, and consumers.

A SNAPSHOT OF THE U.S. PRIMARY CARE SYSTEM

Defining primary care

Primary care is the foundation of the U.S. health care system. It encompasses individuals' first contact with providers for any and all health symptoms or concerns, as well as a broad range of ongoing care. Primary care includes the treatment of common conditions, illnesses, and accidents, including colds and the flu, sore throats, burns and rashes, ear and intestinal infections, and sprains and strains. Preventive services, including health screenings, comprehensive physical exams, and vaccinations, are part of the broad universe of primary care — as is the ongoing treatment and management of individuals with chronic disease and behavioral health conditions. Individuals need primary care services across their life spans, through various states of wellness and disease.

Primary care providers, the frontline of care, serve patients with a wide range of health needs. In some cases they provide routine preventive or follow-up care; at other times they serve as a gateway for patients needing specialist services or hospital care. The efficacy of primary care impacts health expenditures systemwide, as effective preventive care and care coordination can minimize downstream utilization of more expensive services delivered by specialists or in hospitals.

In recent years, the functions and responsibilities of many primary care providers and practices have expanded to address the growing burden of disease prevalence, chronic conditions, mental illness, and substance use disorders. When primary care works well, it initiates and prioritizes care coordination and management; ensures that interventions continue across delivery settings; improves quality, outcomes, and patient experiences; and contains costs by helping patients use services efficiently.

Traditional physician office visits remain the most common way patients receive primary care; however, over time, these visits are increasingly taking place at larger physician group practices, rather than at a small group practice or solo practitioner's office. Individuals also receive primary care services in a range of settings outside of the physician office, including:

- Approximately 1,250 Federally Qualified Health Centers (FQHCs) that provide services at 8,000 individual clinic sites.[18]
- Approximately 3,800 rural health clinics (RHCs); among these, approximately half are freestanding practices and half operate within larger hospitals or health care systems.[19]

- More than 2,000 school-based health clinics (SBHCs), and an estimated 1,000 free clinics that primarily serve the uninsured.[20]
- Retail clinics, which are expected to number more than 3,200 by 2015, compared to approximately 1,300 in 2012.[21]
- Approximately 9,000 urgent care centers, providing services that do not rise to the level of emergency trauma.[22]
- Hospital emergency departments, which remain the default primary care provider for many uninsured individuals and Medicaid beneficiaries.

Primary care represents an estimated 6 percent to 8 percent of national health care spending — approximately $200 to $250 billion annually.[23] Primary care visits account for 55 percent of the 1 billion physician office visits each year in the United States.[24] Primary care office visits decreased slightly, by 0.7 percent, between 2012 and 2013; by contrast, specialist office visits increased by 4.9 percent (see Exhibit 1).[25]

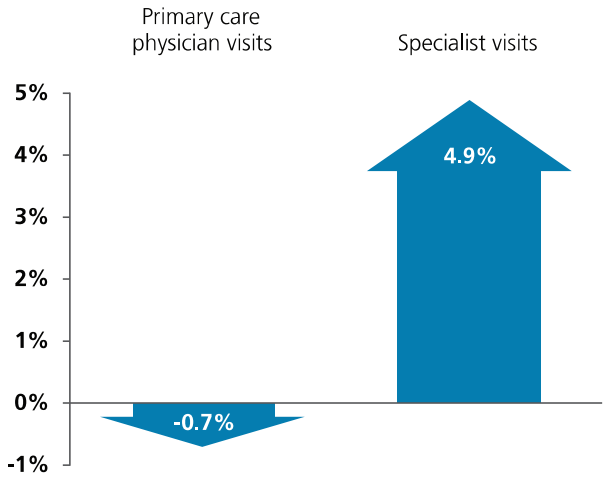
The use of primary care providers to manage patients varies among conditions, depending on a range of factors, including co-occurrence of other health conditions; patient characteristics, including type of insurance coverage; and local market conditions, including the supply of primary care physicians and specialists. For example, diabetes, a chronic condition requiring close patient management and provider coordination, involves use of both primary care providers and specialists. Overall, primary care physicians manage approximately half of diabetes-related outpatient visits; the share is higher for some conditions (85 percent of outpatient visits for chronic obstructive pulmonary disease) and lower for others (37 percent of visits for atrial fibrillation).[26]

Shifting demand

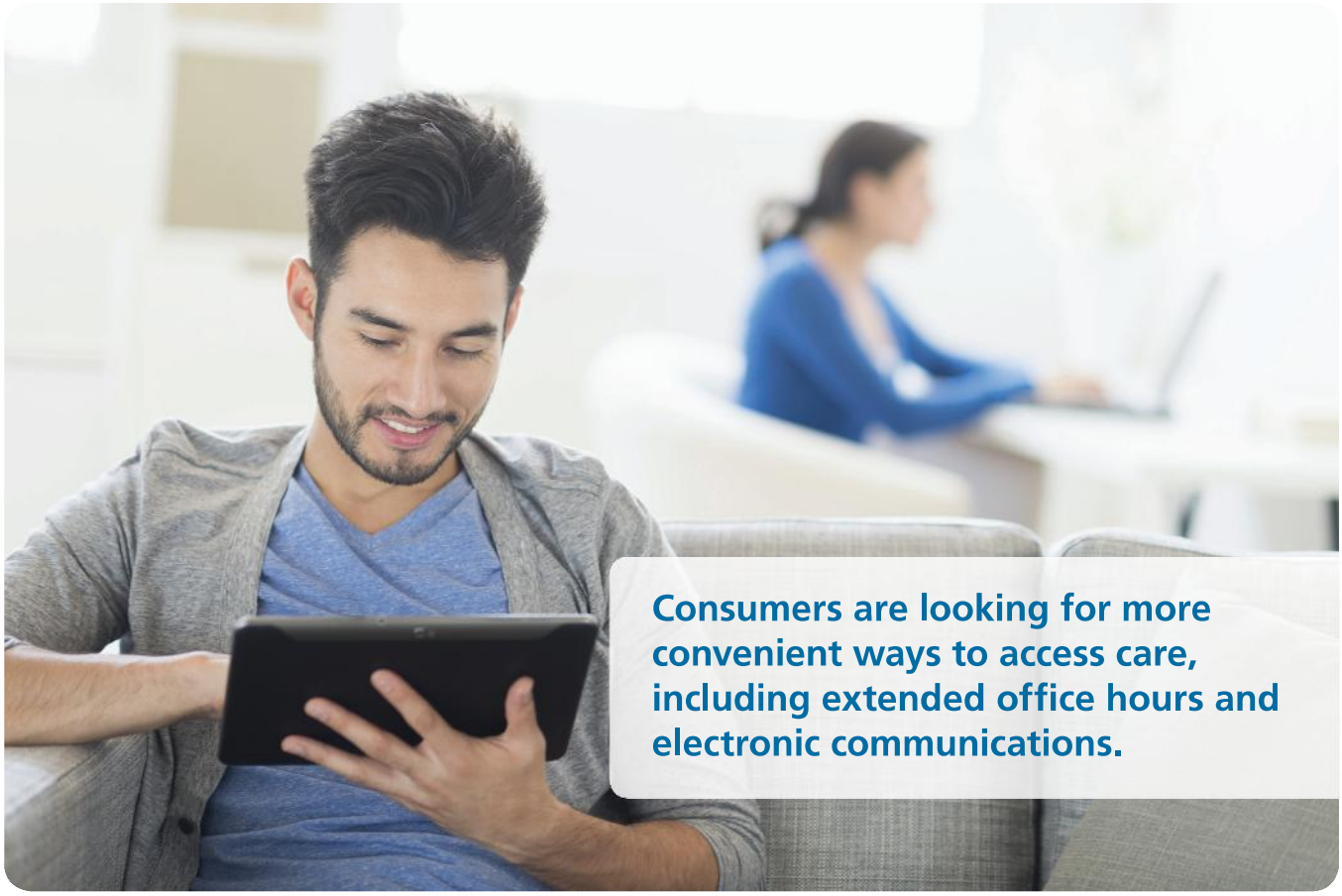
Several forces are leading to higher demand for primary care, including growth of the elderly population. The number of Medicare beneficiaries is projected to increase by one-third in the next decade, from 54 million in 2014 to 72 million by 2024.[27] Medicare beneficiaries have access to certain preventive services without cost-sharing, including an annual wellness visit and personalized prevention plans.

The Affordable Care Act (ACA) ultimately is expected to provide insurance coverage to approximately 30 million additional individuals through state health insurance marketplaces and Medicaid.[28] Requirements for coverage of certain essential health benefits — including maternity

Exhibit 1; Change in office visits by provider type, 2012 to 2013



Source: IMS Institute for Health Informatics, "Medicine Use and Shifting Costs of Healthcare: A Review of the Use of Medicines in the U.S. in 2013," April 2014.



Consumers are looking for more convenient ways to access care, including extended office hours and electronic communications.

and newborn care, preventive services, and chronic disease management — and the elimination of copayments for preventive services will contribute to increased use of primary care services. These factors could translate to an additional 25 million primary care visits annually.[29]

Changes from the ACA could result in an additional 25 million primary care visits annually.

The nature of demand for primary care is also changing, reflecting a more complex and higher-need population. Today, nearly 80 percent of Medicare beneficiaries have at least one chronic condition and two-thirds of beneficiaries have two or more chronic conditions.[30] Rates of chronic disease are increasing, not only for seniors, but also among adults under age 65 and children.[31] Individuals with chronic conditions have a greater need for ongoing treatment, monitoring, and care coordination. Rising demand for mental health services also drives greater reliance on primary care providers, who provide approximately half of all mental health treatments, mostly screening and treatment for depression.[32]

Consumers are increasingly looking for more convenient ways to access care, including in the evenings or on weekends when physician offices are often closed. At the same time, there is increased consumer interest in communicating with providers and accessing their health information electronically. Consumers are open to new avenues for basic clinical encounters that differ from the traditional office visit model.

ASSESSING VALUE AND CAPACITY

The value of primary care

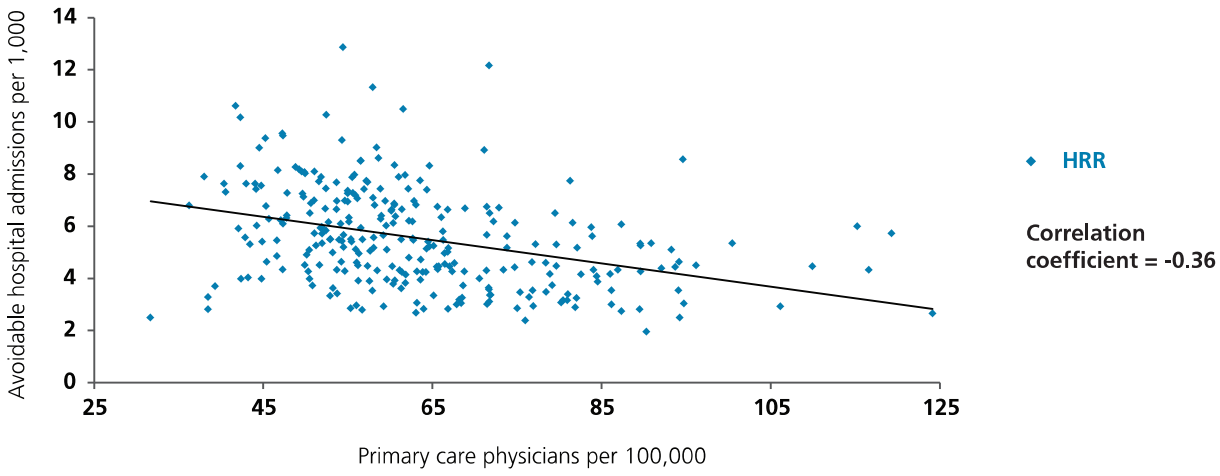
Primary care is central to effectively treating patients. A higher supply of primary care physicians is related to better population health, including lower rates of mortality and more effective delivery of preventive care.[33] An increase of one primary care physician per 10,000 people is associated with fewer hospital inpatient admissions (5.5 percent), outpatient visits (5 percent), emergency department visits (11 percent), and total surgeries (7 percent).[34] There is an association between higher numbers of primary care physicians and more favorable Medicare patient outcomes — specifically lower death rates and fewer hospital visits.[35]

Geographic variation in health care utilization, costs, and outcomes is a strong indicator of differences in access and quality. High rates of avoidable visits to emergency departments and avoidable hospitalizations are a sign that many patients could be treated more appropriately and cost effectively in a primary care setting. An estimated 70 percent of emergency department visits by commercially insured patients in the United States are for non-emergencies.[36]

Among the commercially insured, 70 percent of emergency department visits are for non-emergencies.

An analysis by the UnitedHealth Center for Health Reform & Modernization and Optum Labs underscores that primary care physicians contribute to high-quality, cost-effective care. In areas with a greater supply of primary care physicians, there was lower utilization of costly and avoidable hospital services. Among Health Referral Regions (HRR), geographic units with similar hospital referral patterns, those with a greater number of primary care physicians per 100,000 people had lower rates of avoidable hospital admissions and emergency department visits (correlation coefficients are -0.36 and -0.40, respectively; see Exhibits 2 and 3, and see Appendix for methodology).

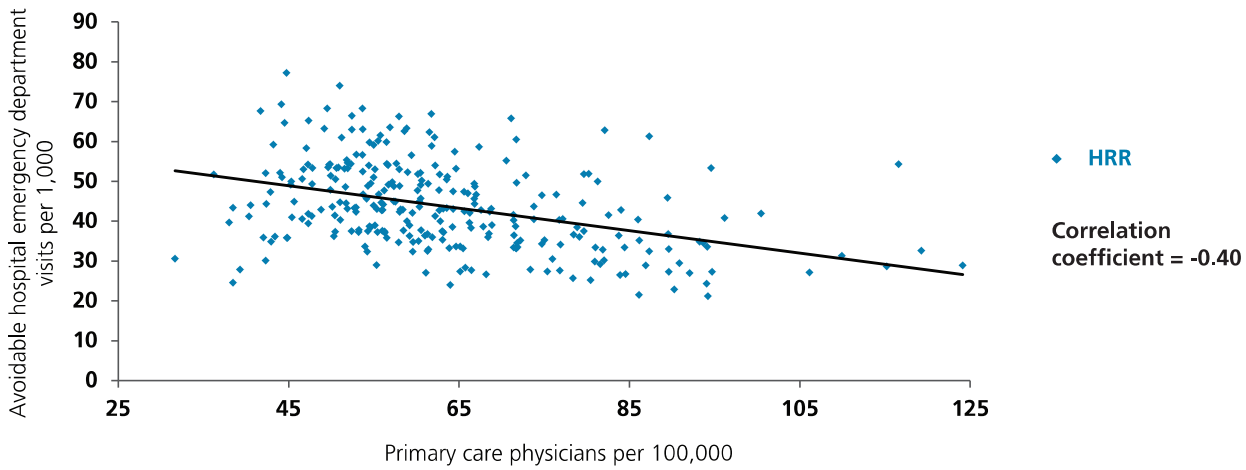
Exhibit 2; Avoidable hospital admissions and primary care physician supply



Source: UnitedHealth Center for Health Reform & Modernization and Optum Labs analysis, 2014.

Note: See Appendix for methodology.

Exhibit 3; Avoidable hospital emergency department visits and primary care physician supply



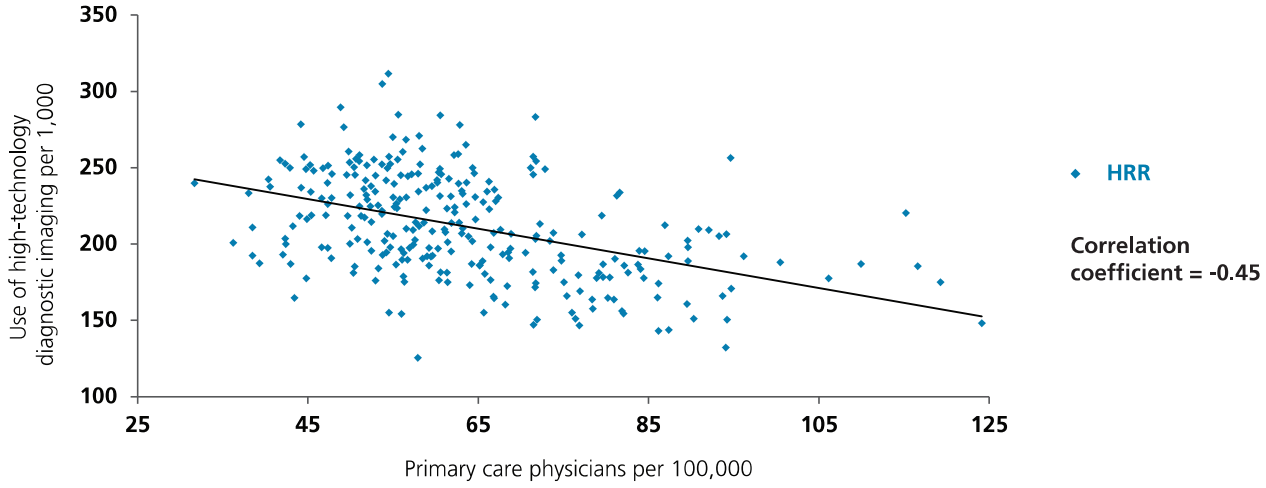
Source: UnitedHealth Center for Health Reform & Modernization and Optum Labs analysis, 2014.

Note: See Appendix for methodology.

In HRRs where there was a greater primary care physician supply, there was less use of high-technology diagnostic imaging (correlation coefficient = -0.45; see Exhibit 4). It appears that communities with a strong primary care infrastructure rely more on traditional and less costly imaging techniques, which often provide enough precision for a physician to achieve an accurate diagnosis.

Where there are more primary care physicians per capita, there are lower rates of avoidable hospital admissions and emergency department visits, and there is less use of high-technology diagnostic imaging. Deficits in primary care contribute to conditions going undiagnosed, health care needs going unmet, and costly utilization of preventable or unnecessary services.

Exhibit 4; Use of high-technology diagnostic imaging and primary care physician supply



Source: UnitedHealth Center for Health Reform & Modernization and Optum Labs analysis, 2014.

Note: See Appendix for methodology.

Provider supply

Understanding primary care capacity and how it is deployed is essential. Many definitions of capacity start with estimates of the supply of primary care physicians. These estimates vary widely, depending on the defined scope of primary care, whether the count is limited to actively practicing physicians or includes all licensed physicians, and whether those in part-time practice are adjusted downward to shares of full-time equivalents (FTEs).

The Association of American Medical Colleges (AAMC) estimates there were 275,000 active primary care physicians in the United States in 2011 — specializing in internal medicine, family medicine, general practice, and pediatrics — including those working 20 hours per week or more.[37] A definition of primary care that includes geriatricians, obstetricians, and gynecologists would result in a higher estimate; an adjustment converting all active physicians to FTEs would result in a lower estimate. The Health Resources and Services Administration (HRSA), using a definition of primary care that includes geriatricians, excludes primary care hospitalists, and converts physicians working part-time to FTE equivalents, estimates there were 205,000 primary care physicians in the United States in 2010.[38]

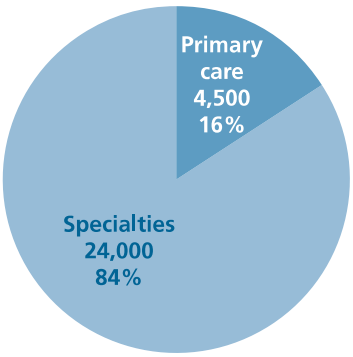
Approximately a third of practicing physicians in the United States are primary care physicians — although the share varies depending on the parameters of the estimate. The ratio of primary care physicians to specialists will likely decline in the near term as the nation's graduate medical programs produced 4,500 primary care physicians and 24,000 specialists in 2014 (see Exhibit 5).[39]

Primary care physicians annually earn approximately half the compensation of orthopedists, cardiologists, and radiologists.[40] In the Medicare program, physician fee-for-service reimbursement is based on the complexity and intensity of the service provided, reducing incentives for physicians to offer primary care services under the program.[41] Lower reimbursement rates and salaries in primary care practice may help steer some medical graduates with substantial student debt toward higher-paying specialties.

Several organizations have expressed concerns about the primary care system's ability to meet the growing demand, with capacity typically estimated through projections of the future supply of primary care physicians. HRSA has estimated a primary care physician shortage of 20,000 FTEs in 2020; AAMC has estimated a shortage of 45,000 primary care physicians in 2020.[42]

Estimates of future supply shortages rely on projections of how new graduates might add to the current workforce in future years, and how retirements based on the age of current providers might decrease it. Estimates also account for greater demand in the future, attributable to the ACA's coverage expansion, the growing number of seniors, and the increase in disease prevalence, including obesity. But complex and interrelated factors make such projections challenging.

Exhibit 5; New medical graduates by field of residency, 2014



Source: National Resident Matching Program, "Results and Data, 2014 Main Residency Match," April 2014.

In some ways, these projections may *understate* the challenge. Planned initiatives to promote primary care in medical schools are not necessarily implemented in a timely fashion.[43] Estimates of retirement rates generally rely on models based on past behavior. They do not account for potential early retirements among physicians in solo or small practices or for new cohorts of graduating physicians who may decide to work fewer hours for significant components of their careers, including when they have young children.

Projecting the adequacy of the future primary care physician workforce depends on a range of assumptions about supply, including rates of retirements and new medical graduates, as well as demand, including rates of insurance coverage and disease prevalence.

However, projections of primary care physician shortages also *understate* overall primary care capacity, by discounting the future supply of all primary care providers including non-physicians. Nurse practitioners and physician assistants are substantial components of the existing and future primary care workforce. The work they perform varies across states and is largely determined by state scope-of-practice laws.

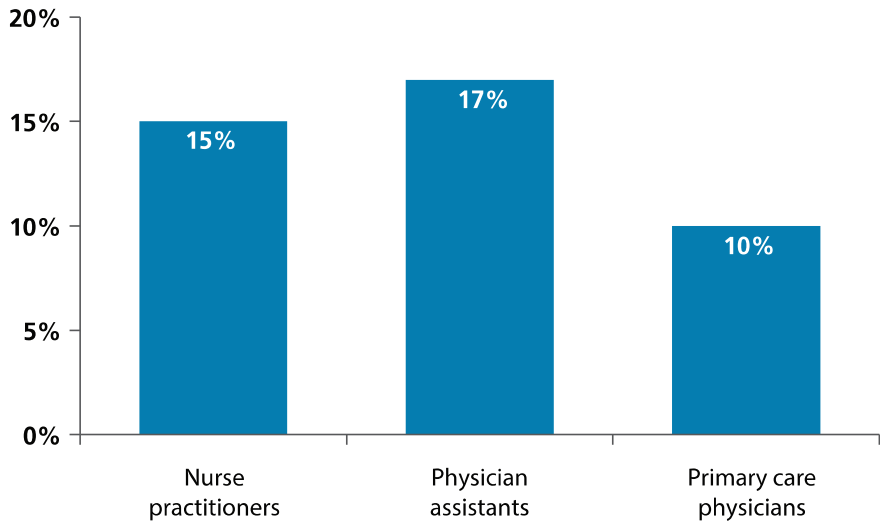
- **Nurse practitioners** (NPs) are advanced practice registered nurses (APRNs) credentialed with at least a master's degree and certified by professional or specialty nursing organizations. In 2013, there were 192,000 NPs in the United States, and almost 85 percent practiced primary care.[44] The number of NP graduates each year has doubled from 6,000 in 2003 to more than 12,000 in 2011; going forward, that figure is projected to increase by 9 percent annually, with the Doctor of Nursing Practice (DNP) becoming the prevailing degree for NPs.[45] Most graduating NPs go on to practice primary care. Approximately half of all states allow NPs to diagnose and treat patients without physician oversight. Eighteen states allow them to independently prescribe medications.[46] Some states allow for less direct physician supervision in nursing homes and community or public health clinics.[47]
- **Physician assistants** (PAs) occupy roles designed as an extension of physicians' capacity, rather than intended for independent practice. Approximately 90,000 individuals have been certified nationally as PAs.[48] In 2010, there were 6,000 graduating PA students and 6,600 first-year PA students.[49] The share of PAs practicing in primary care was 31 percent in 2010, down from 51 percent in 1996.[50] The reasons for this decline include higher pay in specialty fields and increased use of PAs by hospitals in recent years.[51] PAs are allowed to practice and prescribe medication under the supervision of a physician. In some settings, PAs maintain their own panel of patients.

The health care system of the future may have approximately the same number of primary care physicians as are practicing now. An alternative to framing primary care capacity in terms of physician ratios or access to specific *providers* is to focus on consumers' ability to access high-quality primary care services, in a timely fashion, at low costs.

Distribution of resources

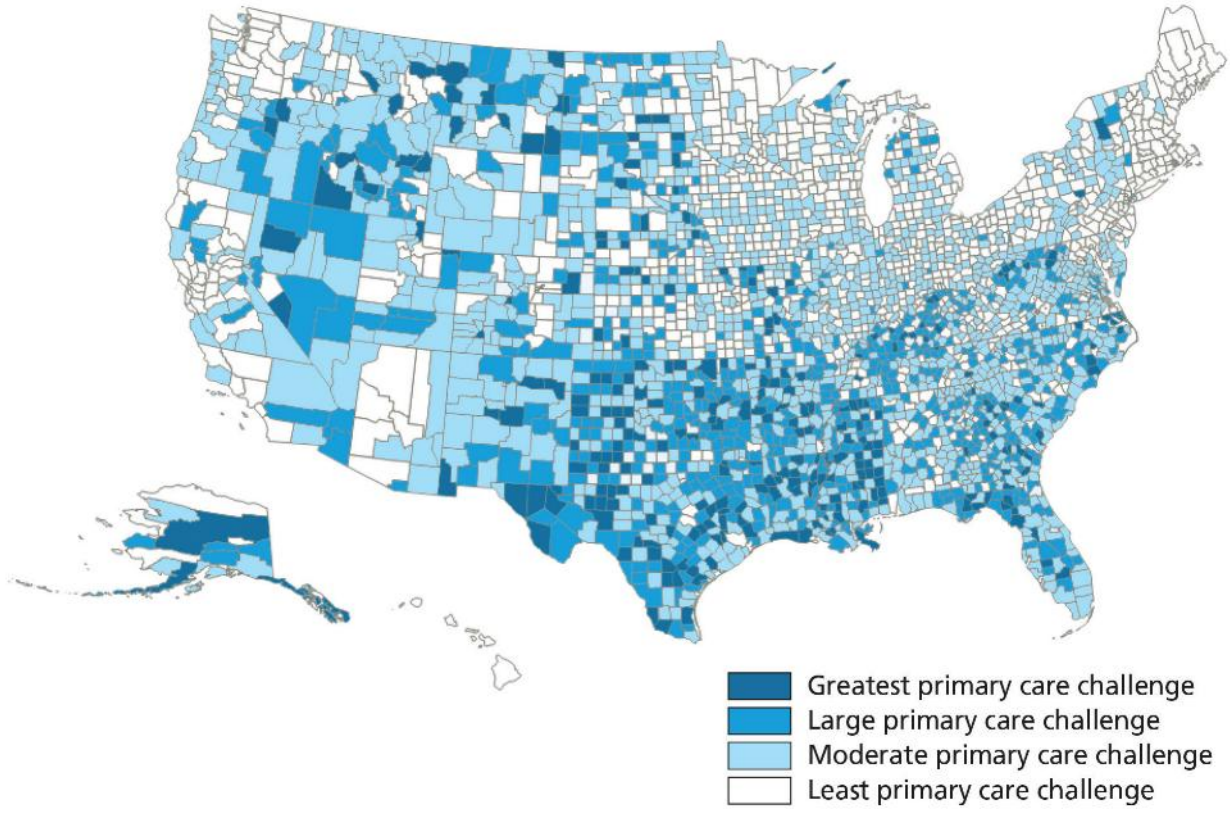
While the nation's overall primary care capacity can be debated, there is clearly a mismatch between the supply of primary care physicians and those in need of primary care services. Approximately 50 million Americans live in areas with an under-supply of primary care physicians, defined as an area with a ratio of one primary care physician per 3,500 people or more.[52] Most of these areas are rural, where the ratio of practicing primary care physicians to residents is less than half that in the rest of the nation.[53] Overall, 59 million individuals live in rural areas, representing about 19 percent of the population.[54] Notably, the percentage of NPs (15 percent) and PAs (17 percent) who practice in rural areas is greater than the percentage of primary care physicians (10 percent) practicing in rural areas (see Exhibit 6).[55]

Exhibit 6; Shares of providers practicing in rural areas, where 59 million individuals live



Source: See Appendix.

Exhibit 7; Primary care challenge by county, 2014



Source: UnitedHealth Center for Health Reform & Modernization analysis, 2013.

Note: Analysis assumes all states ultimately adopt the Affordable Care Act's Medicaid expansion. See Appendix for methodology.

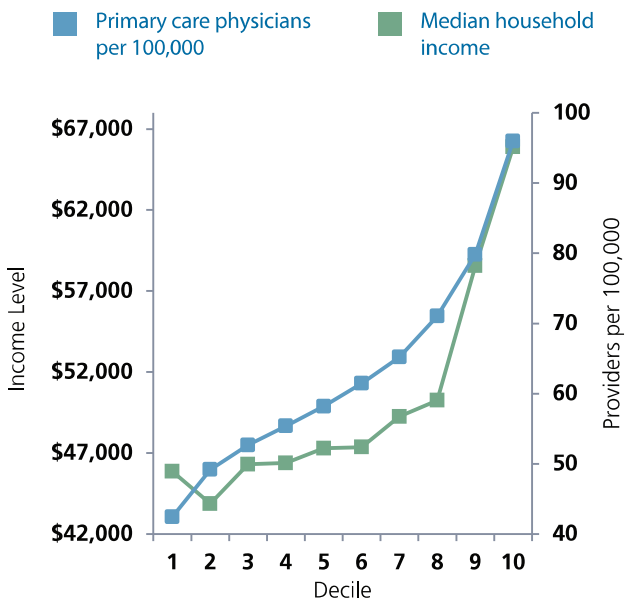
An analysis of the counties expected to face the greatest challenges in ensuring primary care capacity in the coming years indicates that some areas of the country face greater challenges than others, including parts of the West and the South (see Exhibit 7).

An analysis by the UnitedHealth Center for Health Reform & Modernization and Optum Labs shows that socioeconomic factors help explain geographic variation in primary care physician supply. Primary care physicians are more concentrated in higher-income areas. In the 10 percent of HRRs with the lowest concentration of primary care physicians (42 per 100,000 people), the median household income was $46,000. In the 10 percent with the highest concentration (96 per 100,000 people), it was $66,000 (see Exhibit 8).

Primary care physicians also are concentrated where residents — and potential patients — are more likely to have insurance coverage. In the 10 percent of HRRs with the fewest primary care physicians, the uninsured rate for the non-elderly was 17 percent; in those with the highest concentration, it was 11 percent (see Exhibit 9).

There is a higher concentration of non-physician primary care providers where the supply of primary care physicians is lower. Thus, NPs and PAs are concentrated in areas with lower median household incomes and higher rates of uninsured residents.

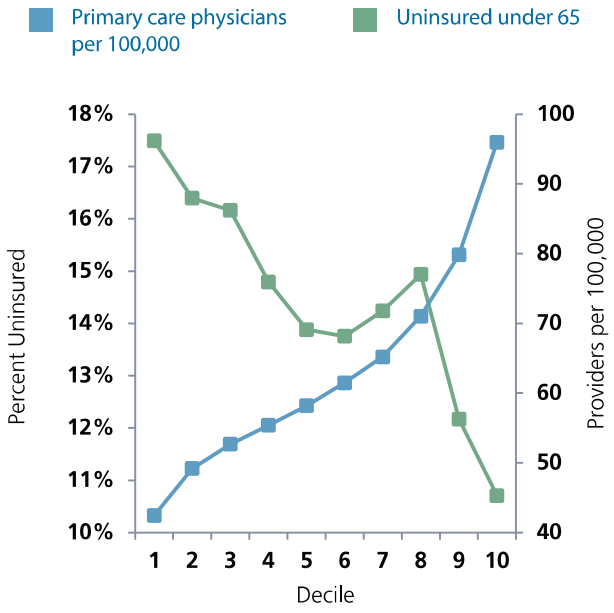
Exhibit 8; Median household income and primary care physician supply



Source: UnitedHealth Center for Health Reform & Modernization and Optum Labs analysis, 2014.

Note: See Appendix for methodology.

Exhibit 9; Uninsured rate for nonelderly and primary care physician supply

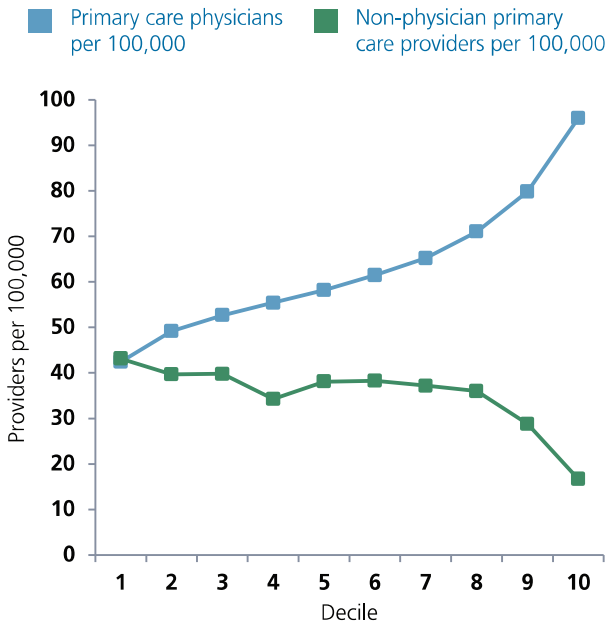


Source: UnitedHealth Center for Health Reform & Modernization and Optum Labs analysis, 2014.

Note: See Appendix for methodology.

In the 10 percent of HRRs with the lowest concentration of primary care physicians, the concentration of NPs and PAs was highest (43 per 100,000 people), and there were approximately equal numbers of physician and non-physician providers (see Exhibit 10). By contrast, in the 10 percent of HRRs with the most primary care physicians per capita, the concentration of NPs and PAs was lowest (17 per 100,000 people) and there were nearly six physicians for every NP or PA.

Exhibit 10; Supply of primary care physicians and non-physician primary care providers



Source: UnitedHealth Center for Health Reform & Modernization and Optum Labs analysis, 2014.

Note: See Appendix for methodology.

Because the supply of primary care physicians is concentrated away from rural areas, in higher-income communities, and away from the uninsured, simply increasing physician supply may not be enough to effectively address unmet demand for primary care services in all areas of the country. The same patterns hold for specialist physicians, indicating that capacity and access are challenges not only for primary care delivery.

These findings corroborate conclusions by Dartmouth University researchers that training more physicians may, in fact, increase regional inequities, since four out of five new physicians will likely practice in high-supply regions rather than underserved areas.[56] Increased roles for NPs and PAs would add to the system's overall primary care capacity, and could help target capacity to areas where there are fewer primary care physicians.

BUILDING BLOCKS FOR BOLSTERING CAPACITY

Leveraging a diverse workforce

Current initiatives aimed at training more primary care physicians alone might not meet growing primary care demands, especially in low-income and rural areas. One solution to increasing primary care capacity and improving access to services may include leveraging other clinicians, including NPs and PAs, as integrated parts of the health care delivery system.

Some primary care physician practices have undertaken an approach that enables NPs and PAs to "practice at the top of their licenses." This approach allows physician practices to grow their panel size and see more patients, with patients benefitting from shorter wait times. These integrated multi-level practices have distributed care delivery responsibilities to match the varied complexities of patient needs with the skill sets of physicians, NPs, and PAs.

Studies have shown that specific primary care services provided by nurse practitioners were comparable to those provided by physicians.

There is evidence supporting greater roles for NPs in delivering primary care services. A broad range of research studies, including three randomized controlled trials, have found that specific primary care services provided by NPs were comparable to those provided by physicians.[57] In some instances, NPs have had better results on measures of patient follow-up, consultation time, and the provision of screening, assessment, and counseling.[58] Finally, there is evidence that NPs in states with tighter restrictions on scopes of practice provide a comparable standard of care as in states where they have more clinical responsibilities and autonomy.[59]

States have been active recently in reforming scope-of-practice laws, with almost all states having considered doing so since 2011.[60] Non-physician clinicians are voluntarily increasing their credentialing, including through the use of clinical doctoral programs and extended years of education.[61] In addition, HRSA has launched an initiative to increase the number of PAs practicing in primary care settings by recruiting and training recently discharged military medical personnel who lack civilian PA certification.[62]

Use of non-physicians can increase the capacity of primary care practices, allowing physicians to care for nearly twice as many patients and focus on more complex tasks.

Allowing non-physicians to take on increased responsibility could result in a capacity windfall for primary care practices, including a near-doubling of patient panel size per physician and a pathway for physicians to focus on more complex tasks.[63] Changes in the use of non-physician providers are already underway at the practice level in all states. This is a reflection of NPs' and PAs' existing credentials and their capacity to help address demand for primary care services.

Advancing effective roles for NPs and PAs depends on greater use of evidence-based guidelines, rigorous quality measurement frameworks, and quality improvement initiatives for non-physician providers. A significant barrier to achieving more dramatic and rapid progress is payment policy. Medicare and Medicaid generally reimburse less for services delivered by NPs and PAs than for the same services when performed by physicians.[64]

Assembling multi-disciplinary care teams

As both panel size and rates of chronic conditions increase, it may become difficult for primary care physicians to spend large quantities of time with all of their patients, or even see each patient at every visit.[65] A primary care physician with a panel of 2,000 patients would need to spend an estimated 17.4 hours per day providing recommended preventive, chronic, and acute care — and many primary care physicians have larger panels.[66]

Assembling multi-disciplinary care teams can leverage additional capacity to help practices deliver services to their patients. Practices can rethink how non-physicians work most effectively with physicians and with each other in well-integrated and high-functioning teams. In a transformed primary care practice, the physician's scarce time can be deployed in a more deliberate and targeted fashion. Moving toward team-based care and sharing clinical responsibilities with non-physicians is one of several practice changes linked to improving primary care physicians' satisfaction with their work.[67]

Multi-disciplinary care teams allow physicians to use their time and skills more deliberately, while practices provide high-quality primary care to more patients. Physicians practicing in multi-disciplinary teams have greater satisfaction with their work.

Integrating behavioral health and pharmacy services into primary care practices is a further step in developing the team-based approach.[68] When a redesigned care setting includes co-location or integration of behavioral health providers, practices can more uniformly screen for and treat mental health conditions and substance use disorders. Pharmacists, who have expertise in medication management and in counseling patients on adherence, side effects, and other issues, can play an increased role when embedded within a primary care practice.[69]

A critical function of team-based care is care coordination. The typical primary care physician in a single year coordinates with an average of 229 other physicians in 117 different practices for their Medicare patients.[70] Various members of the care team need to be able to share information about patients and coordinate their component of the treatment plan with colleagues. High-performing practices have achieved both practice efficiencies and improved patient care through greater staff capacity, including deploying medical assistants to issue pre-visit questionnaires, manage patients' health records, prepare post-exam summaries, and reinforce care plans with patients.[71] In addition, health coaches can work with patients to focus on behavioral change.

The typical primary care physician must coordinate with 229 other physicians in 117 different practices for their Medicare patients each year. Sharing information among team members helps primary care practices coordinate care.

Standardizing care processes and protocols can drive significant improvements in care delivery and can help practices shift toward non-visit-based population health management.[72] With work delegated to medical assistants and health coaches, NPs can perform more direct patient care, including more chronic disease management.[73] Such approaches can be self-sustaining, allowing for a greater number of patient visits and, thus, increased practice revenue to cover the costs of additional team members.[74]

Almost half of primary care physicians worked in practices of one or two physicians in 2010.[75] Many primary care physicians are leaving solo and small-group practices in favor of larger primary care or multi-group practices, including hospital-owned practices. Group practices — whether single-specialty or multi-specialty — offer some advantages for improving practice efficiency and building team-based care. These include pooled capital; shared overhead costs, particularly related to information systems; and increased care coordination capacity.

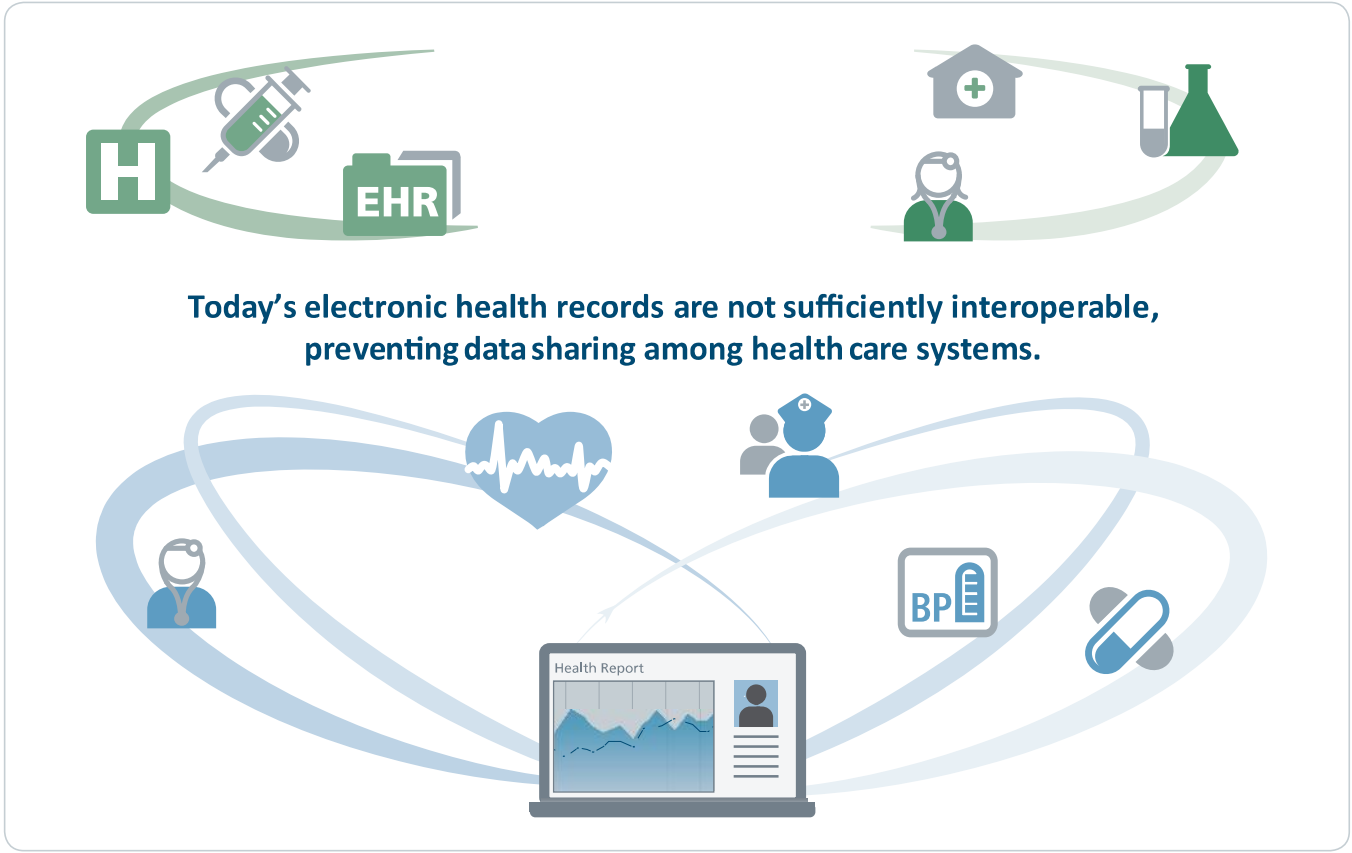
Utilizing health information technology

Health information technology (HIT), including electronic health records (EHRs) and interoperable data exchange, allows primary care practices to organize and disseminate information across the delivery system in real time — improving care coordination, increasing quality, and lowering costs.[76] Broader implementation of HIT, along with greater use of teams that include non-physicians, can expand systemwide capacity to meet increased demand while improving access to primary care.[77]

Adoption of EHRs alone is insufficient to achieve dramatic improvements in primary care delivery, but it is an essential building block for broad and ambitious efforts to leverage HIT. Adoption rates for EHRs among primary care physicians are approximately 70 percent, double the rate of five years ago, with younger physicians and those who practice in a group setting even more likely to have adopted an EHR.[78] But rates of adoption are higher than rates of satisfaction and impactful use. Approximately two-thirds of primary care physicians practicing internal medicine (65 percent) and family medicine (63 percent) reported that investing in EHRs had led to revenue losses for their practices.[79]

The federal government has invested substantially in providing financial incentives to physician practices to adopt EHRs and to leverage their capabilities through a staged functionality approach known as meaningful use. But barriers to impactful use remain significant. Data is fragmented and cannot be shared easily across incompatible health information systems; therefore, today's EHRs are not sufficiently interoperable. Additional barriers to adoption and impactful use include ongoing system administration and maintenance costs; technical issues related to training, support, customization, and reliability; a decrease in productivity stemming from initial adoption; and concerns regarding privacy and security.[80]

Physicians ultimately approve of EHRs in concept. However, investments in the deployment and impactful use of HIT require significant time commitments and upfront costs that will pose difficulty for some primary care practices. This gap — between the level of change needed and the capacity for change management — is a fundamental challenge for primary care, and for the health care delivery system more broadly.



ADVANCED SERVICE DELIVERY AND PAYMENT MODELS

Medical homes

Private and public payers continue to work with providers to implement patient-centered medical homes (PCMHs), sometimes simply called medical homes.[81] Operated primarily by physician group practices, typically staffed by multi-disciplinary care teams, and enabled by HIT, medical homes bring to bear several core building blocks for bolstering primary care capacity. Financial support, from public or private payers, is designed to address primary care needs by enabling more coordination of care and better patient management. Some states are using health homes, a Medicaid option under the ACA, to build on the medical home model, for example by integrating behavioral health providers to treat severe mental illness and substance use disorders, and by coordinating support services accessible through other means-tested programs.

Medical home models have shown promise for years, and some have achieved successful results. Group Health Cooperative in Washington state has operated medical homes in 25 clinics through an approach employing multi-disciplinary primary care teams, care management for patients with chronic conditions, electronic health records, and patient outreach and education.[82] Group Health also used capitated payments to encourage care coordination activities and to make providers accountable for the health care utilization and health outcomes of their patients.[83] Over a two-year period, Group Health generated a $1.50 return on each dollar invested in the PCMH and achieved a $10 per member per month (PMPM) reduction in total costs, in part due to a 16 percent reduction in hospital admissions and a 29 percent reduction in emergency department visits (see Exhibit 11).[84]

Success, however, has not been uniform. A recent evaluation of one of the nation's largest multi-payer medical home pilots, the Pennsylvania Chronic Care Initiative, found no statistically significant differences in

total or ambulatory care-sensitive hospital admissions or emergency department visits, or in overall health care costs, between pilot and comparison practices.[85] Of the study's 11 quality measures related to diabetes, asthma, and preventive care, patients in the medical home pilot fared statistically better on one measure.[86] A second independent study, focused on a largely overlapping sample of medical home practices, also found no significant reductions in costs for the overall population, but identified reductions in downstream utilization and total spending for the highest-risk patients.[87]

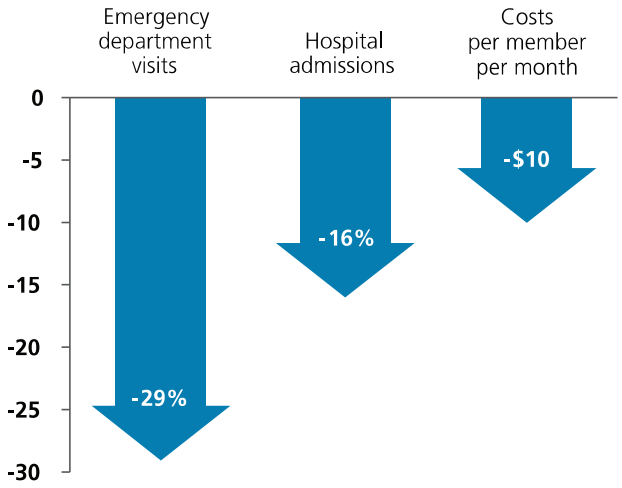
Evidence indicates the size as well as the HIT and analytic capabilities of physician practices are factors in achieving results through medical homes. In general, smaller practices appear to have greater difficulty than larger ones in improving patients' health outcomes and

lowering costs.[88] Larger practices, and those with more management capacity and greater use of EHRs, have shown more success.[89] Often medical homes lack the timely feedback and data necessary to effectively manage patients' downstream utilization of care.

Another key factor appears to be how medical homes are reimbursed. Some programs that link bonus payments to achieving recognition as an accredited PCMH, as well as other measures of structure or processes, do not provide incentives to contain overall patient costs, such as through gain-sharing or partial capitation payment models.[90] Without such clear incentives, it is more challenging to define success around health outcomes, appropriate utilization, and overall costs.

UnitedHealthcare's medical home model integrates a range of capabilities. These include support for practice transformation, an engaged physician leadership, the integration of care management in practice workflow through a dedicated care manager, the exchange of data and analytics between the medical home and the payer that is real-time and bi-directional, upfront investments in HIT, and patient engagement in the care process over the long term. Even when all of these criteria are met, success also depends on a financial model that rewards value (see Box 1).

Exhibit 11; Group Health Cooperative PCMH change in cost and utilization, 2007 to 2009



Source: Robert Reid, Katie Coleman, Eric A. Johnson, Paul A. Fishman, Clarissa Hsu, Michael P. Soman, Claire E. Trescott, Michael Erikson, and Eric B. Larson, "The group health medical home at year two: cost savings, higher patient satisfaction, and less burnout for providers," *Health Affairs*, 2010, 29(5): 835-843.

Box 1; Results from UnitedHealthcare's patient-centered medical home programs

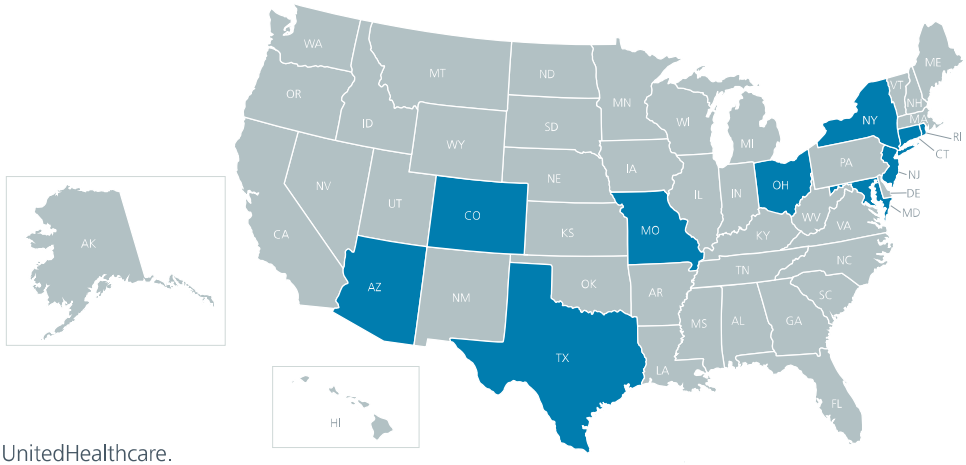
UnitedHealthcare currently operates 13 medical home programs in 10 states for the commercially insured population (see Exhibit 12). These programs include more than 2,000 participating physicians and 300,000 members. An actuarial evaluation of four programs in Arizona, Colorado, Ohio, and Rhode Island, based on three full years of operation between 2009 and 2012 for 40,000 members, found **average gross savings of 7.4 percent of medical costs in the third year** compared to a control group. Every dollar invested in care coordination activities produced $6 in savings in the third year (a return on investment of approximately 6 to 1). The costs of the interventions were 1.2 percent of medical costs and they offset 16 percent of the gross savings. **Including the cost of the intervention, the programs saved approximately 6.2 percent of medical costs on average.**

Achieving returns takes time as there are substantial upfront costs when setting up the medical home program, including making infrastructure investments. Demonstrated infrastructure and capacity are prerequisites for practices to participate, rather than program goals. These models also focus on process measures of quality, measures of health outcomes, and reductions in downstream utilization and costs, depending on the maturity of the model. Internal actuarial analyses showed reductions in inappropriate emergency department utilization and lower readmission rates.

Additional analysis examined the results for a cohort of individuals who were in the medical home practice on day one of the study period and remained in the medical home for the full period of analysis. The purpose of this analysis was to test whether longer member engagement leads to greater reductions in cost and utilization. In the four states noted above, there were larger annual reductions in cost growth for this cohort than for the full population. The return on investment was 7 to 1, suggesting higher returns from approaches that focus resources on a population over time to drive improvements in their health.

Independent third-party evaluations completed for four medical home programs in three states (Rhode Island, Colorado, and Ohio) showed improvement on quality measures for preventive and chronic care, access, care coordination, use of health information technology, and patient satisfaction. In particular, chronic care quality measures improved, reflecting practice investments in that area. Success was notable for diabetes management. However, not all measures met program targets, particularly those related to some cancer screenings, suggesting opportunities for improvement.

Exhibit 12; States with UnitedHealthcare medical home programs



Source: UnitedHealthcare.

Accountable care organizations

Another emerging service delivery model is the accountable care organization (ACO), in which the primary care group practice is often a critical component of an integrated system of care delivery. Federal government initiatives to advance ACOs include the Medicare Shared Savings Program, which allows participating providers to share financial gains from reduced utilization and costs, and the Medicare Pioneer ACO Program, in which a small number of leading integrated delivery systems have opportunities for a larger financial upside through shared savings but also face downside risk. In addition, health plans are partnering with providers, including primary care practices, to implement ACO models in commercial markets and in state Medicaid programs.

Evidence about the efficacy of the ACO model has been mixed to date. In the first year of Medicare's Pioneer ACO program, only eight of 32 organizations had significantly lower growth in total Medicare spending per beneficiary than their local market comparison groups.[91] By the second year, several ACOs had left the program.

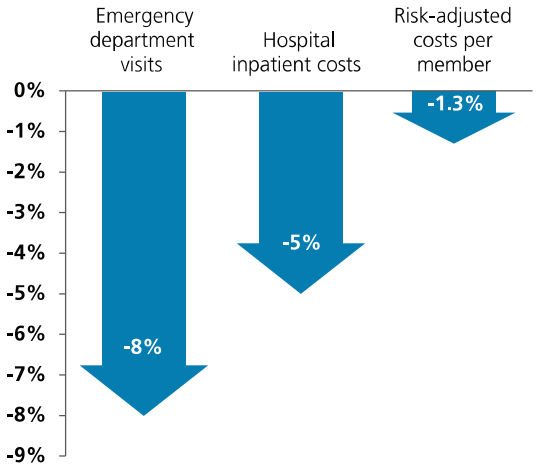
UnitedHealth Group participates in ACOs as a payer and as an analytic partner to help providers assess patients' needs and redesign care delivery. See Box 2 and Box 3 for two of those experiences. As in the medical home model, success depends on an integrated approach to creating measureable value that includes a central role for payment reform.

Box 2; Results from WESTMED's accountable care organization

WESTMED Practice Partners (WESTMED) is a multi-specialty group practice in New York, with 250 physicians and 1,000 employees. WESTMED operates a physician-led ACO for fully insured commercial members of UnitedHealthcare plans. Launched in 2012, WESTMED's ACO emphasizes primary care through a medical home program, uses state-of-the-art systems and EHRs, and has weekend and evening hours. Its physicians rely on Optum's analytic tools to access health information about their patients, to view evidence-based guidelines to support decisions at the point of care, to identify best practices for disease management, and to measure their own performance areas over time. **These analytic tools also provide WESTMED physicians, for the first time, a view of what services their members receive outside of the practice to enhance their management capacity across the care continuum.** Payment is linked to cost and quality through bonus arrangements; performance metrics included those that measure quality, health outcomes, patient satisfaction, and reduction of medical costs through appropriate service use.

In its first year of operation, for 13,000 covered lives, **the ACO improved on nine of 10 health quality metrics, increased patient satisfaction, and reduced health care costs**. There were significant improvements in patients taking their prescription medications properly; people with diabetes had more routine screenings and kept better control of blood sugar levels. **Between 2011 and 2012, there was an 8 percent reduction in emergency department utilization, a 5 percent decrease in hospital inpatient cost, and a 1.3 percent reduction in risk-adjusted costs per member** (see Exhibit 13).

Exhibit 13; WESTMED ACO change in utilization and costs, 2011 to 2012



Source: UnitedHealthcare and Optum.

Box 3; Results from Monarch HealthCare's accountable care organization

Monarch HealthCare is a multi-specialty independent physician group practice of about 2,500 physicians, including more than 700 primary care physicians, in Southern California. CMS recognized Monarch for its strong track record of offering coordinated, patient-centered care, and for having the experience and capacity to bear financial risk based on its performance, awarding it Pioneer ACO status.

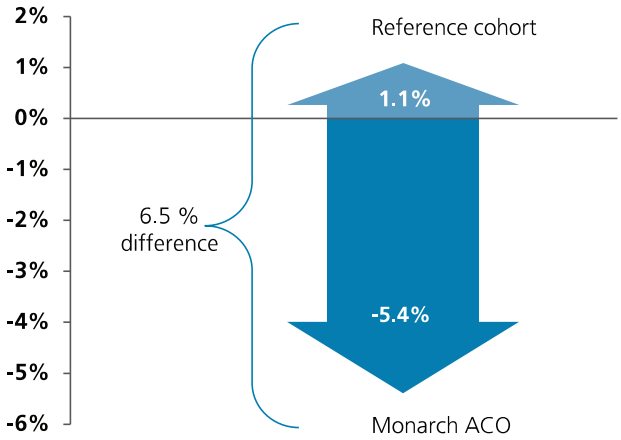
Monarch HealthCare®
A Medical Group, Inc.

Monarch's ACO identifies the individuals that benefit from the practice's disease management programs; these include patients with diabetes, congestive heart failure, chronic obstructive pulmonary disease, or kidney failure. Using Optum's analytic tools to conduct a risk analysis, Monarch identifies high-risk patients within those chronic condition cohorts. Monarch then determines the appropriate care management models. All models rely on multi-disciplinary care teams with a care navigator, responsible for triaging care needs and scheduling appointments, serving as the primary contact for patients.

Patient engagement occurs during physician office visits, through extensive physician training and scripting; during or immediately after a hospital admission or other acute event, using notifications of admissions through hospital partnerships; and immediately following a new diagnosis, through education and counseling. Web-based point-of-care tools allow physicians to review key events and encounters in a patient's medical history, perform health risk assessments, review lab results and prescriptions, and identify required screenings and gaps in care. Monarch also is working to provide physicians and patients with more information on comparative pricing.

In the first year of the Medicare Pioneer ACO demonstration, **Monarch was the top performing of 32 ACOs on three measures of quality: physician communication with the patient, overall patient satisfaction with their physician, and prevention of admissions for ambulatory care sensitive conditions.** Monarch's Pioneer ACO ranked second out of 32 on containing costs. It reduced Medicare spending by 5.4 percent in 2012 from the 2011 baseline for attributed ACO beneficiaries, compared to a 1.1 percent increase for a reference cohort (see Exhibit 14). The cost savings were achieved principally through reductions in hospital admissions, skilled nursing facility utilization, and unit costs.

Exhibit 14; Monarch ACO change in total Medicare spending, 2011 to 2012



Source: Optum.

Paying for value

Under fee-for-service, the dominant payment model for primary care in the United States, physicians are reimbursed for the volume of care delivered, with a payment value attached to each unit of service.[92] This approach incents the delivery of a greater quantity and higher intensity of services; it does not promote high-quality care based on best practices and coordination among providers.[93] Studies have shown that physicians who are reimbursed under fee-for-service react to those incentives by recommending more services than physicians who are reimbursed through alternative methods.[94] As much as half of wasteful health care spending results from failures of care delivery and care coordination, as well as overtreatment — all of which could be improved by moving away from the fee-for-service reimbursement model.[95]

Reforms that delink payments from units of care, and instead prioritize value, are fundamental to increasing primary care capacity and improving the effectiveness and efficiency of service delivery. Examples include:

- Performance-based bonuses as modifications to traditional fee-for-service payments. These payments can be linked to quality measures and utilization benchmarks.
- Risk-adjusted monthly payments for primary care services. This model could be developed with payments geographically adjusted to address variation in underlying practice patterns.[96]
- Gain-sharing through shared savings. This model orients providers to the total cost of care, without exposing them to downside risk.
- Risk-adjusted aggregate capitation payments to group practices and integrated delivery systems. This model promotes accountability for clinical outcomes and cost management at the practice level, without assigning too much financial risk to individual providers — an approach that generally has less appeal to primary care physicians.

These value-based approaches rely to a large extent on group practices and integrated delivery systems, because scale is an important criterion for spreading the fixed costs of building a care management and HIT infrastructure, as well as for spreading risk. While there is increasing participation in value-based payment models among primary care physicians, many practices continue to rely on a volume-based model for a substantial share of their revenue.[97] Some smaller practices may need financial support and technical assistance to acquire and implement the HIT infrastructure and practice protocols necessary to transition successfully away from a fee-for-service model.

APPROACHES TO EXPAND ACCESS AND TARGET CAPACITY

Leveraging the retail health infrastructure

Clinics in large retail outlets — such as CVS, Walgreens, Target, and Walmart — hold potential for large-scale innovation in primary care by providing consumers with convenient access to high-quality care that is affordable. The retail clinic model typically includes central roles for non-physician providers, allowing for an expansion in primary care capacity.

The range of services offered at retail health clinics varies. Some focus on preventive and primary care; others provide a broader continuum of care. Optum Clinic offers a diverse range of services, allowing consumers to address more of their needs in a convenient setting. This model uses multi-disciplinary care teams to deliver wellness exams; treatment of illnesses, sprains, and factures; wound closures; and same-day, on-site labs and x-rays.

Between 2007 and 2012, the volume of retail clinic visits grew more than six-fold, from 1.5 million to 10 million annually.[98] Close to half of retail clinic visits take place when physician offices are closed.[99] Retail clinics are particularly popular among 18- to 44-year-olds, who account for 43 percent of clinic patients.[100]

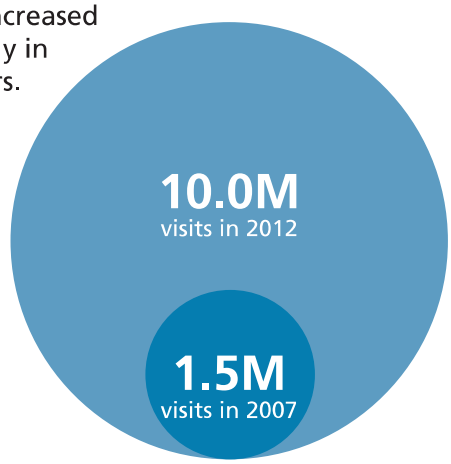
Nearly all retail clinics accept reimbursement from private insurance; a slightly lower share accepts Medicare; and approximately 60 percent accept Medicaid.[101] Overall, private or public insurance covers two-thirds of retail clinic visits.[102] Retail clinics also offer value to uninsured patients, as costs per visit tend to be more affordable than in physician offices.[103]

Evidence indicates that the quality and cost of services provided by retail clinics offer significant value. One study found retail clinics' performance on 12 quality measures was comparable to that of physician offices and urgent care centers and higher than that of hospital emergency departments.[104] Retail clinic treatment costs for several common illnesses are substantially lower than those for similar episodes at physician offices, urgent care centers, and emergency departments.[105]

Since many retail clinics are based on a one-time or episodic model of care, there are questions about whether they will complement and support other models of primary care delivery and promote continuity of patient-provider relationships. In addition, research suggests that retail clinics may not be increasing access for many under-served communities, because they are more likely located in metropolitan versus rural areas.[106]

However, retail clinics often accept more forms of insurance than office-based physicians — typically at lower cost. A RAND study found that retail clinics typically serve younger adult patients who do not have a regular health care provider.[107] In such cases, there is no continuity of care to be disrupted. Moreover, a component of many retail clinics' business models is to serve the uninsured.

The number of retail clinic visits has increased dramatically in recent years.



Retail clinics can be and are increasingly integrated into primary care delivery. They commonly use EHRs and share them with the patient's primary care or other provider, though they face the same challenges to impactful use of HIT as other providers.[108] Many retail clinics are investing in new infrastructure to ensure interoperability for EHRs.

Retail clinics are investing in new infrastructure to ensure interoperability for EHRs and greater clinical integration into primary care delivery.

Several plans and large employers have formed partnerships with retail clinics, focused on lowering consumers' out-of-pocket costs. By including these clinics in their networks and encouraging members to use them — and by ensuring the clinic transmits information to a patient's regular primary care provider — payers can advance retail clinics' integration into the health care delivery system, both clinically and financially.

Reaching patients where they live

Delivering primary care and preventive services to individuals in their homes is an effective approach to improving access and care delivery. A key advantage of conducting clinical visits in the home is that the review of environmental and social conditions provides valuable information and context to inform an individual's treatment plan. For example, assessment and remediation of trip hazards for the purpose of preventing falls among the elderly is an important benefit of an in-home visit, as is a first-person observation of medication supplies for patients with multiple chronic conditions. These services are difficult to replicate in an office setting. In addition, observing changes in the home environment over time adds an important line of sight into the life and overall well-being of the patient, particularly those with functional limitations (see Box 4).

Box 4; Optum's HouseCalls program

HouseCalls is a care management program that provides annual in-home clinical visits to health plan members, including those with chronic conditions. These visits help to identify and close gaps in clinical care, and are an important part of the care continuum. HouseCalls employs more than 1,200 licensed physicians and nurse practitioners who conduct home visits. In 2013, HouseCalls conducted approximately 670,000 visits in 37 states — an increase from six states in 2011.

The 45 to 60 minutes of scheduled one-on-one time with a clinician is longer than a typical office visit and provides clinically robust encounters that are in many ways indistinguishable from other professional medical services. During the HouseCalls visit, the clinician performs: a review of the patient's health history; a thorough medication review; a physical exam including screenings for key health metrics and symptoms, including nutrition, depression, pain, cognitive impairment, and functional status; where possible, collection of lab specimens and administration of a flu vaccine; identification of gaps in care; and an opportunity for the patient and any caregivers to discuss their health and ask questions about their current conditions and treatment.

HouseCalls visits support ongoing care and promote care coordination for beneficiaries. **After a visit, a Plan of Care is provided to both the member and his or her primary care provider.** A key component of the treatment plan includes educating and counseling members on managing chronic conditions, identifying signs and symptoms of disease exacerbation, and mitigating risk factors. The member is provided with an "Ask Your Doctor" letter, which includes diagnoses made during the visit and the HouseCalls clinician's recommendations for follow-up care. Information provided to the member's primary care provider includes a diagnosis list; an assessment of each diagnosis; recommendations for each diagnosis; a current medication list, including any noted adherence issues; vital signs; screening results; recommendations for screenings and vaccines; and narrative notes.

Results from the HouseCalls program

The HouseCalls program leads directly to needed follow-up encounters and closes gaps in care. Among UnitedHealthcare Medicare Advantage members receiving a HouseCalls visit in 2013:

- Nearly two-thirds (64 percent) received a follow-up service under Medicare within 30 days.
- There was a 5.1 percent increase in colorectal screening and a 6.9 percent increase in breast cancer screening.

Source: UnitedHealthcare and Optum.

Utilizing group visits

An evolving approach for improving access to primary care and increasing the efficient use of primary care resources is shared medical appointments, sometimes termed group visits. Under this model, patients attend medical appointments with groups of patients with similar needs, sometimes on a frequent basis. During those visits, patients have both private examinations and group education sessions.

One advantage of group visit models is that they are an efficient use of provider time compared to individual care.[109] NPs can support direct clinical needs, and additional members of a multi-disciplinary care team can support the educational components of the program. Patient groups commonly number five to 20 for a period of one to two hours, depending on their condition.

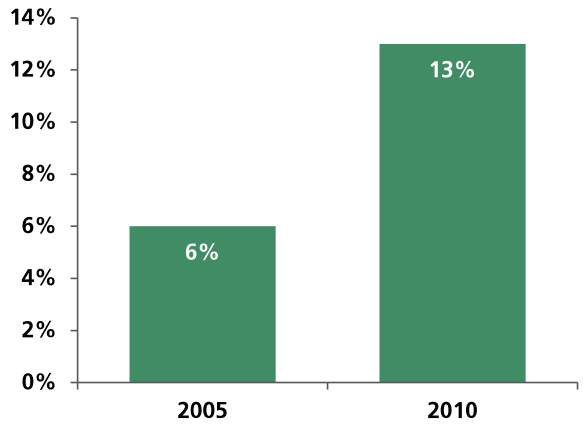
One example is UnitedHealth Group's Expect With Me program for prenatal care, in which a physician or midwife and a trained assistant deliver comprehensive prenatal care to groups of eight to 12 women of the same gestational age. During each two-hour visit, women participate in self-care, checking their weight and blood pressure, and receive an individual examination by the midwife or physician, before joining the group for education and skills building. The program offers greater practice efficiency by combining each woman's traditional 15-minute appointment with a two-hour group session. Studies have also demonstrated that women who participate in group prenatal care have better birth outcomes than women in individual prenatal care.[110]

Shared medical visits can decrease emergency department and specialty visits, reduce hospital admissions, increase patient satisfaction, and improve patient outcomes.[111] Multiple randomized controlled trials have demonstrated that shared visits have achieved success on a range of measures, including reducing hospital admissions and emergency department visits among chronically ill older patients; improving problem-solving ability, quality of life, and clinical outcomes among patients with diabetes; and reducing the risk of preterm birth and improving sexual risk behavior among pregnant women.[112]

The group visit model succeeds in part due to higher levels of patient engagement and activation. The group dynamic helps individuals learn successful lifestyle management strategies, obtain greater self-management skills and confidence, and develop self-motivational and peer support.[113] Research shows that an individual's health-related behaviors are influenced by the behaviors of those around them and that social support within group care is tied to greater patient satisfaction.[114]

Use of group visits is not widespread, in part because approaches to provider reimbursement vary and are still evolving.[115] In 2010, 13 percent of family physicians provided at least some care through group visits, up from 6 percent in 2005 (see Exhibit 15).[116] This trend may accelerate as care delivery and payment models evolve and achieve greater acceptance among physicians and patients.

Exhibit 15; Share of family physicians utilizing group visits, 2005 and 2010



Source: Victoria Stagg Elliott, "Group Appointments Can Serve Both Patients and Practices," *American Medical News*, September 19, 2011.

Engaging complex patients

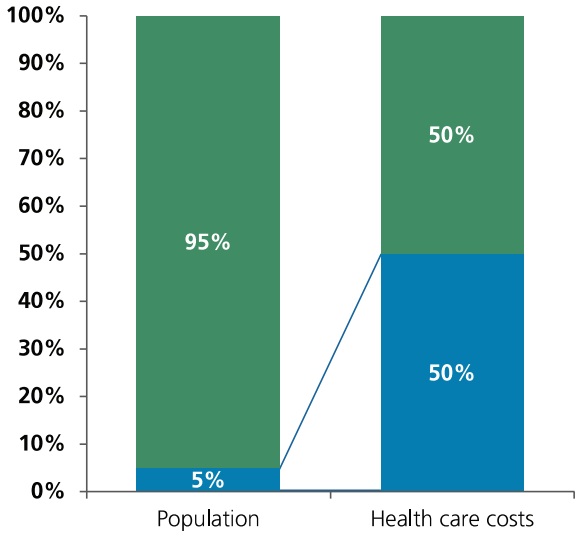
Making the most effective use of primary care services and better leveraging capacity to reduce overall spending requires a greater focus on complex and costly patients. In a study of more than 3 million commercial patients over more than three years, 40 percent of those with a single claim had more than one chronic condition (see Exhibit 16).[117] In general, 5 percent of the population accounts for 50 percent of health care costs each year, with more than one in three (38 percent) of these "super-utilizers" remaining in the most costly 5 percent of people the following year (see Exhibit 17).[118]

"Super-utilizers" typically have chronic conditions and rely frequently on hospital emergency departments and inpatient services to address needs that often can be managed through earlier and less costly interventions. These individuals, more often men than women, are more likely to have serious and persistent mental illness, substance use disorders, or both; and they often face poverty, unemployment, and fragmented home and community environments.[119]

When providers and health plans use data effectively, they can identify high-risk patients that will benefit from primary care interventions, and they can target specific approaches to address those patients' needs. Targeting "super-utilizers" requires analytic models that map patients' clinical characteristics to utilization levels, in order to better capture the difference between expected and actual utilization.[120]

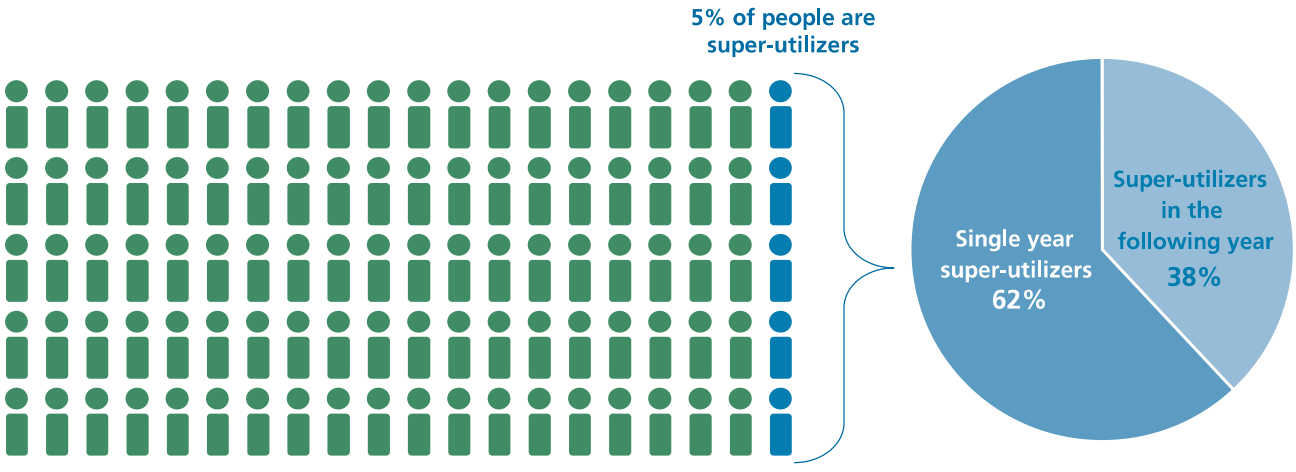
Payment models that appropriately reimburse for such an intensive level of primary care services are still evolving.[121] These models should reflect the importance of underlying data and analytics and should incorporate payments for bundles of services tailored to defined patient subgroups.[122] Advancing payment reform is fundamental for scaling interventions that are tailored to "super-utilizers."

Exhibit 16; Super-utilizers as share of population and share of health care costs



Source: Robert Greene, Edwin Dasso, Sam Ho, Jerry Frank, Graeme Scandrett, Ash Genaidy, "Patterns and Expenditures of Multi-Morbidity in an Insured Working Population in the United States: Insights for a Sustainable Health Care System and Building Healthier Lives," *Population Health Management*, 2013, 16(6):381-9.

Exhibit 17; Super-utilizers as share of population in a single year and the following year



Source: Steven Cohen, Namrata Uberoi, "Differentials in the Concentration in the Level of Health Expenditures across Population Subgroups in the U.S., 2010," *Statistical Brief #42*, Agency for Healthcare Research and Quality, Rockville, MD, August 2013. Steven Cohen, William Yu. "The Concentration and Persistence in the Level of Health Expenditures over Time: Estimates for the U.S. Population, 2008 – 2009," *Statistical Brief #354*, Agency for Healthcare Research and Quality, Rockville, MD, January 2012.

APPENDIX: DATA SOURCES AND METHODS

Primary care challenge by county

The UnitedHealth Center for Health Reform & Modernization developed state-level estimates of the number of individuals who will be newly eligible for and who will newly enroll in Medicaid under the ACA's coverage expansion, assuming that all states ultimately would implement this expansion; estimates of those who will enroll in the new state health insurance marketplaces; and estimates of the number of people who otherwise would have been uninsured. Estimates of the county-level distribution of newly insured people in each state use county-level distributions of the non-elderly population and the uninsured from the U.S. Census.

The U.S. Census Small Area Health Insurance Estimates are the source of the county-level uninsured figures. County-level estimates of the newly insured were combined with data on the supply of health professionals and facilities from the Health Resource and Services Administration's Area Health Resource File. The micro-simulation used to estimate coverage under the ACA produced state-level estimates. Distributions of those results across counties contain additional uncertainty because they are based on current county-level estimates of the uninsured. Because these estimates include many undocumented persons, county-level distributions of the newly insured in some areas may be weighted too heavily.

Primary care quality and supply of providers by Hospital Referral Region

Commercial claims data for the period 2011-2012 were aggregated to the Hospital Referral Region (HRR) level. This data includes 19.5 million members, including both self-insured and fully insured. Utilization rates are based on member enrollment in a given month to adjust for variations in enrollment over the data period. Condition prevalence measures are based on enrollment during the analytic period.

The 306 HRRs included in the analysis were split into 10 equivalently sized groups based on the number of primary care providers per 100,000 people. The 31 HRRs with the lowest primary care physician concentration were included in the bottom decile, while the HRRs with the highest primary care physician rates were in the top decile. The relationships between physician supply and measures of interest were studied by taking the means of those measures in each decile of physician supply.

The analysis examined the variation between primary care physician supply and other characteristics at the HRR level, relying on correlation coefficients to determine the strength of the relationship between two variables. It compared variation in primary care physician supply per 100,000 to avoidable hospital admissions per 1,000, avoidable emergency department visits per 1,000, and high-technology diagnostic imaging procedures per 1,000.

Measures of quality were obtained using the Evidence Based Medicine (EBM-Connect) software application, a leading tool for assessing gaps in care. Measurements of avoidable admissions and avoidable emergency department visits were developed internally, based on the algorithms of avoidable utilization used by AHRQ and the Massachusetts Department of Health.[123] Avoidable admissions and avoidable emergency department visits were based on the primary discharge diagnosis.

Examples of diagnoses included in the avoidable admissions measure are admissions for asthma, congestive heart failure (CHF), dehydration, and ear, nose and throat (ENT) infection. Examples of avoidable emergency department visits include ear infection, pharyngitis, back pain, and asthma. High-technology diagnostic imaging is an area of possible over-utilization among the commercially insured population. The high-technology diagnostic imaging rate per 1,000 members is gathered through procedure codes, including imaging use in both outpatient and inpatient settings.

Estimates of the number of non-physician primary care providers — NPs and PAs — per 100,000 residents are from the U.S. Office of the National Coordinator for Health Information Technology, for the year 2011. Estimates of primary care physicians per 100,000 residents are from the American Medical Association Physician Master File, for 2010. Estimates of median household income are from the American Community Survey, for the years 2005 through 2009. Estimates of the rates of uninsured are from the U.S. Census Bureau's Small Area Health Insurance Estimates program, for 2009.

Providers practicing in rural areas

The source for Exhibit 6 on page 12, "Shares of providers practicing in rural areas, where 59 million individuals live," is as follows: Thomas Bodenheimer, Hoangmai H. Pham, "Primary Care; Current Problems and Proposed Solutions," *Health Affairs*, 2010, 29(5):799-805. Susan M. Skillman, Louise Kaplan, Meredith A. Fordyce, Peter D. McMenamin, Mark P. Doescher, "Understanding Advanced Practice Registered Nurse Distribution in Urban and Rural Areas of the United States Using National Provider Identifier Data," Final Report, Rural Health Research Center, University of Washington, 137, 2012. American Academy of Physician Assistants, "Quick Facts." Accessed February 25, 2014.

UnitedHealthcare's medical home evaluation

UnitedHealthcare's actuarial evaluation methodology relied on a statistical approach that compares the annual change in performance for the medical home population versus a comparison population, called a *difference-in-differences* approach. To establish the comparison population, matching data were used — through a process called *propensity score matching* — from 12 months leading up to the medical home launch in the same market.

Patients were matched using claims data for a broad range of measures including age, sex, utilization, spending, and presence of certain chronic conditions. The evaluation looked at all commercial members attributed to a given practice, not just those participating in a medical home program, and it included those who left or joined the medical home during the life of the program. Over the study period, there was a 10 percent to 20 percent increase in the attributed population per year in the study programs.

REFERENCES

1 Allan H. Goroll, Robert A. Berenson, Stephen C. Schoenbaum, Laurence B. Gardner, "Fundamental Reform of Payment for Adult Primary Care: Comprehensive Payment for Comprehensive Care," *Journal of General Internal Medicine*, 2007, 22(3):410-415. Robert L. Phillips, Andrew Bazemore, "Primary Care and Why it Matters for US Health System Reform," *Health Affairs*, 2010, 29(5):806-810. U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, "National Health Expenditure Data Projections 2012-2022," November 2013.

2 Table 1; Source: Physician office visits, by selected physician characteristics: United States, Centers for Disease Control and Prevention, 2010 National Ambulatory Medical Care Survey, CDC/NCHS, 2010.

3 Adam N. Hoffer, Jean M. Abraham, Ira Moscovice, "Expansion of Coverage Under the Patient Protection and Affordable Care Act and Primary Care Utilization," *The Milbank Quarterly*, March 2011, 89(1):69-89.

4 Barbara Starfield, Leiyu Shi, James Macinko, "Contribution of Primary Care to Health Systems and Health," *The Milbank Quarterly*, 2005, 83(3):457-502. Michael Chernew, Lindsay Sabik, Amitabh Chandra, Joseph P. Newhouse, "Would Having More Primary Care Doctors Cut Health Spending Growth?" *Health Affairs*, 2009, 28(5):1327-1335. James Macinko, Barbara Starfield, Leiyu Shi, "Quantifying the Health Benefits of Primary Care Physicians Supply in the US," *International Journal of Health Services Research*, 2007, 37(1):111-126.

5 Robert Wood Johnson Foundation, "What We're Learning: Reducing Inappropriate Emergency Department Use Requires Coordination with Primary Care," Quality Field Notes, Issue Brief 1, September 2013.

6 U.S. Department of Health and Human Services, Health Resources and Services Administration, "Shortage Designation: Health Professional Shortage Areas and Medically Underserved Areas/Populations," 2014.

7 Thomas Bodenheimer, Hoangmai H. Pham, "Primary Care; Current Problems and Proposed Solutions," *Health Affairs*, 2010, 29(5):799-805. Susan M. Skillman, Louise Kaplan, Meredith A. Fordyce, Peter D. McMenamin, Mark P. Doescher, "Understanding Advanced Practice Registered Nurse Distribution in Urban and Rural Areas of the United States Using National Provider Identifier Data," Final Report #137, Rural Health Research Center, University of Washington, 2012. American Academy of Physician Assistants, "Quick Facts." Accessed February 25, 2014.

8 Thomas Bodenheimer, Hoangmai H. Pham, "Primary Care; Current Problems and Proposed Solutions," *Health Affairs*, 2010, 29(5):799-805.

9 Mark W. Friedberg, Kathryn L. Coltin, Dana Gelb-Safran, Marguerite Dresser, Alan M. Zaslavsky, Eric C. Schneider, "Associations Between Structural Capabilities of Primary Care Practices and Performance on Selected Quality Measures," *Annals of Internal Medicine*, 2009, 151(7):456-463. Marci Nielsen, Nwando Olayiwola, Paul Grundy, Kevin Grumbach, "The Patient-Centered Medical Home's Impact on Cost & Quality, An Annual Update of the Evidence, 2012-2013," Patient Centered Primary Care Collaborative, January 2014. Ronald A. Paulus, Karen Davis, Glenn D. Steele, "Continuous Innovation in Health Care: Implications of the Geisinger Experience," *Health Affairs*, 2008, 27(5):1235-1245. Onur Asan, Enid Montague, "Physician Interactions with Electronic Health Records in Primary Care," *Health Systems*, 2012, 1(2):1-8.

10 Linda V. Green, Sergei Savin, Yina Lu, "Primary Care Physician Shortages Could Be Eliminated through Use of Teams, Nonphysicians and Electronic Communication," *Health Affairs*, 2013, 32 (1):11-19.

11 Harold Miller, "From Volume to Value: Better Ways to Pay for Health Care," *Health Affairs*, 2009, 28(5):1418-1428. Institute of Medicine, *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America,* National Academies Press, 2013, 229.

12 Donald Berwick, Andrew Hackbarth, "Eliminating Waste in US Health Care," *Journal of the American Medical Association*, 2012, (14):1513-1516.

13 Stephanie Watson, "More Americans Using Retail Health Clinics," *Harvard Health Blog*, May 10, 2013.

14 RAND, "Use of Retail Medical Clinics Continues to Grow; Older Patients and Preventive Services on Rise," August 15, 2012.

15 Tricia M. Leahey, Rajiv Kumar, Brad M. Weinberg, Rena R. Wing, "Teammates and Social Influence Affect Weight Loss Outcomes in a Team-based Weight Loss Competition," *Obesity*, 2012, 20(7):1413-1418.

16 Kelly B. Bartley, Rebecca Haney, "Shared Medical Appointments: Improving Access, Outcomes and Satisfaction for Patients with Chronic Cardiac Diseases," *Journal of Cardiovascular Nursing*, 2010, 25(1):13-19. Jeffrey Bendix, Amanda Brower, "The Benefits of Sharing: Shared Medical Appointments Can Improve Your Patients' Outcomes and Your Practice's Efficiency," *Medical Economics*, 2011, 88(3):68-71. Karen S. Yehle, Laura P. Sands, Patricia A. Rhynders, Gail D. Newton, "The Effect of Shared Medical Visits on Knowledge and Self-Care in Patients With Heart Failure: A Pilot Study," *Heart Lung*, 2009, 38(1):25-33.

17 Steven Cohen, Namrata Uberoi, "Differentials in the Concentration in the Level of Health Expenditures across Population Subgroups in the U.S., 2010," *Statistical Brief #42*, Agency for Healthcare Research and Quality, Rockville, MD, August 2013. Steven Cohen, William Yu, "The Concentration and Persistence in the Level of Health Expenditures over Time: Estimates for the U.S. Population, 2008-2009," *Statistical Brief #354*, Agency for Healthcare Research and Quality, Rockville, MD, January 2012.

18 Kaiser Commission on Medicaid and the Uninsured, "Community Health Centers: Opportunities and Challenges of Health Reform," September 13, 2010.

19 Working Paper 6, Modernizing Rural Health Care: Coverage, Quality and Innovation, UnitedHealth Center for Health Reform and Modernization, July 2011.

20 Jessamy Taylor, "The Primary Care Safety Net: Strained, Transitioning, Critical," George Washington University Policy Forum, Background Paper #79, September 28, 2010. Working Paper 6, Modernizing Rural Health Care: Coverage, Quality and Innovation, UnitedHealth Center for Health Reform and Modernization, July 2011.

21 RAND, "Use of Retail Medical Clinics Continues to Grow; Older Patients and Preventive Services on Rise," August 15, 2012. Stephanie Watson, "More Americans Using Retail Health Clinics," *Harvard Health Blog*, May 10, 2013. Nicole Ostrow, "Retail Health Clinics More Popular on Ease for Patients," *Bloomberg*, July 22, 2013. The market is dominated by three major corporations: CVS Caremark, Target and Walgreens.

22 Tracey Yee, Amanda Lechner, Ellyn Boukus, "The Surge in Urgent Care Centers: Emergency Department Alternative or Costly Convenience?" Center for Studying Health System Change Research Brief 26, July 2013.

23 Allan H. Goroll, Robert A. Berenson, Stephen C. Schoenbaum, Laurence B. Gardner, "Fundamental Reform of Payment for Adult Primary Care: Comprehensive Payment for Comprehensive Care," *Journal of General Internal Medicine*, 2007, 22(3):410-415. Robert L. Phillips, Andrew Bazemore, "Primary Care and Why it Matters for US Health System Reform," *Health Affairs*, 2010, 29(5):806-810. U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, "National Health Expenditure Data Projections 2012-2022," November 2013.

24 Table 1; Source: Physician office visits, by selected physician characteristics: United States, Centers for Disease Control and Prevention, 2010 National Ambulatory Medical Care Survey, CDC/NCHS, 2010.

25 IMS Institute for Health Informatics, "Medicine Use and Shifting Costs of Healthcare: A Review of the Use of Medicines in the U.S. in 2013," April 2014.

26 Exhibit 1; Source: "Number and percentage of outpatient chronic condition visits by physician type in the past year, based on the 2008 National Ambulatory Medical Care Survey," from "Patients With High-Cost Chronic Conditions Rely Heavily on Primary Care Physicians," *Journal of the American Board of Family Medicine*, 2014, 27:11-12.

27 U.S. Congressional Budget Office, "April 2014 Medicare Baseline." Figures are average monthly enrollment during the federal fiscal year for Medicare Part A.

28 U.S. Congressional Budget Office, "Updated Budget Projections: 2014-2024," April 14, 2014.

29 Adam N. Hoffer, Jean M. Abraham, Ira Moscovice, "Expansion of Coverage Under the Patient Protection and Affordable Care Act and Primary Care Utilization," *The Milbank Quarterly*, 2011, 89(1):69-89.

30 U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, "Chronic Conditions Among Medicare Beneficiaries Chartbook: 2012 Edition," 2012.

31 U.S. Department of Health and Human Services, National Center for Health Statistics, "Health, United States, 2013: With Special Feature on Prescription Drugs," Hyattsville, MD, 2014.

32 Bazelon Center for Mental Health Law, "Primary Care Providers' Role in Mental Health," Healthcare Reform Issue Brief, 2009.

33 Barbara Starfield, Leiyu Shi, James Macinko, "Contribution of Primary Care to Health Systems and Health," *The Milbank Quarterly*, 2005, 83(3):457-502. Michael Chernew, Lindsay Sabik, Amitabh Chandra, Joseph P. Newhouse, "Would Having More Primary Care Doctors Cut Health Spending Growth?" *Health Affairs*, 2009, 28(5):1327-1335. James Macinko, Barbara Starfield, Leiyu Shi, "Quantifying the Health Benefits of Primary Care Physicians Supply in the US," *International Journal of Health Services Research*, 2007, 37(1):111-126.

34 Stephen J. Kravet, Andrew D. Shore, Redonda Miller, Gary B. Green, Ken Kolodner, Scott M. Wright, "Health Care Utilization and the Proportion of Primary Care Physicians," *American Journal of Medicine*, 2008, 121(2):142-148.

35 Chiang-Hua Chang, Therese A. Stukel, Ann Barry Flood, David C. Goodman, "Primary Care Physician Workforce and Medicare Beneficiaries' Health Outcomes," *Journal of the American Medical Association*, 2011, 305(20):2096-2104.

36 Robert Wood Johnson Foundation, "What We're Learning: Reducing Inappropriate Emergency Department Use Requires Coordination with Primary Care," Quality Field Notes, Issue Brief 1, September 2013.

37 Association of American Medical Colleges, Center for Workforce Studies, 2012 Physician Specialty Databook, November 2012.

38 Health Resources and Services Administration, U.S. Department of Health and Human Services, "Projecting the Supply and Demand for Primary Care Practitioners Through 2020," November 2013.

39 National Resident Matching Program, "Results and Data, 2014 Main Residency Match," April 2014.

40 Medscape, "Physician Compensation Report, 2013," 2013.

41 Medicare physician reimbursement is based on a complex formula called the resource-based relative value scale (RBRVS). This assessment of the relative value of services provided by a given physician measures inputs like the time, technical skill, mental effort, and judgment required to perform a service, as well as practice expenses.

42 Health Resources and Services Administration, U.S. Department of Health and Human Services, "Projecting the Supply and Demand for Primary Care Practitioners Through 2020," November 2013. Association of American Medical Colleges, "The Impact of Health Care Reform on the Future Supply and Demand for Physicians - Updated Projections Through 2025," June 2010.

43 Casey Tilton, Sana Danish, Clese Erickson, "U.S. Medical Schools' Ongoing Efforts to Meet Physician Workforce Needs," Association of American Medical Colleges, Analysis in Brief, June 2013.

44 American Association of Nurse Practitioners, "NP Fact Sheet," 2014.

45 Mary D. Naylor, Ellen T. Kurtzman, "The Role of Nurse Practitioners in Reinventing Primary Care," *Health Affairs*, 2010, 29(5):893-899. In 2004, the American Association of Colleges of Nurses recommended increasing qualification for an Advanced Practice Registered Nurse (APRN) from a master's degree to a Doctor of Nursing Practice (DNP) by 2015. Entry level NPs can extend their training to three or four years of advanced nursing education or additional education beyond their current two-year masters training.

46 Stephen Isaacs, Paul Jellinek, "A Decision-Makers Guide to Scope of Practice," The Physicians Foundation, October 2012: 12-15. *Health Affairs* and the Robert Wood Johnson Foundation, "Nurse Practitioners and Primary Care," *Health Policy Brief*, October 25, 2012. Tracy Yee, Ellyn Boukus, Dori Cross, Divya Samuel, "Primary Care Workforce Shortages: Nurse Practitioners Scope-of-Practice Laws and Payment Policies," National Institute for Health Care Reform, Research Brief No. 13, February 2013. "Primary Care Professionals: Recent Supply Trends, Projections, and Valuation of Services," Statement of A. Bruce Steinwald, Director, Health Care, Government Accountability Office, before the Health Education, Labor and Pensions Committee, February 12, 2008. Tine Hansen-Turton, Jamie Ware, Frank McClellan, "Nurse Practitioners in Primary Care," *Temple Law Review*, 2009, 82:1235-1262.

47 Tracy Yee, Ellyn Boukus, Dori Cross, Divya Samuel, "Primary Care Workforce Shortages: Nurse Practitioner Scope-of-Practice Laws and Payment Policies," National Institute for Health Care Reform, Research Brief 13, 2013. Kaiser Family Foundation, "Improving Access to Adult Primary Care in Medicaid," March 1, 2011. Rebecca Bryan, Marianne Buzby, Ann O'Sullivan, "The Healthcare Reform Law and APRN Practice," Medscape, April 24, 2012. The ACA listed APRNs among Medicare's ACO professionals and eligible for bonus payments under the Medicare program. The ACA also funded educational programming to train NPs and funded demonstration projects to increase NP and APRN utilization.

48 U.S. Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook, 2014-2015 Edition, Physician Assistants, 2014.

49 American Academy of Physician Assistants, "Quick Facts." Accessed February 25, 2014.

50 Bettie Coplan, James Cawley, James Stoehr, "Physician Assistants in Primary Care: Trends and Characteristics," *Annals of Family Medicine*, 2013, 11(1):75-79.

51 Tracy Keizer, "Five Things Physicians Should Know about Physician Assistants," *Minnesota Medicine*, 2012, 97(11):45-46. The American Academy of Physician Assistants, American College of Physicians, "Internists and Physician Assistants: Team-Based Primary Care: A Policy Monograph," 2010.

52 U.S. Department of Health and Human Services, Health Resources and Services Administration, "Shortage Designation: Health Professional Shortage Areas and Medically Underserved Areas/Populations," 2014.

53 Thomas Bodenheimer, Hoangmai H. Pham, "Primary Care; Current Problems and Proposed Solutions," *Health Affairs*, 2010, 29(5):799-805.

54 U.S. Census Bureau, "Frequently Asked Questions: How many people reside in urban or rural areas for the 2010 Census? What percentage of the U.S. population is urban or rural?" 2011.

55 Thomas Bodenheimer, Hoangmai H. Pham, "Primary Care; Current Problems and Proposed Solutions," *Health Affairs*, 2010, 29(5):799-805. Susan M. Skillman, Louise Kaplan, Meredith A. Fordyce, Peter D. McMenamin, Mark P. Doescher, "Understanding Advanced Practice Registered Nurse Distribution in Urban and Rural Areas of the United States Using National Provider Identifier Data," Final Report #137, Rural Health Research Center, University of Washington, 2012. American Academy of Physician Assistants, "Quick Facts." Accessed February 25, 2014.

56 David C. Goodman, Elliott S. Fisher, Kristen K. Bronner, "Hospital and Physician Capacity Update: A Brief Report from the Dartmouth Atlas of Health Care," March 30, 2009.

57 Stephen Isaacs, Paul Jellinek, "Accept No Substitute: A Report on Scope of Practice," The Physicians Foundation, November 2012. Institute of Medicine, "The Future of Nursing," October 5, 2010. Mary D. Naylor, Ellen T. Kurtzman, "The Role Of Nurse Practitioners In Reinventing Primary Care," *Health Affairs*, 2010, 29(5):893-899. Joanne M. Pohl, Charlene Hanson, Jamesetta A. Newland, Linda Cronenwett, "Unleashing Nurse Practitioners' Potential to Deliver Primary Care and Lead Teams," *Health Affairs*, 2010, 9(5):900-905. Kaiser Family Foundation, "Improving Access to Adult Primary Care in Medicaid: Exploring the Potential Role of Nurse Practitioners and Physician Assistants," Kaiser Commission on Medicaid and the Uninsured Issue Paper, March 2011. Catherine Dower, Sharon Christian, and Edward O'Neil, "Promising Scope of Practice Models for the Health Professions," Center for the Health Professions, University of California, San Francisco, 2007.

58 Mary D. Naylor, Ellen T. Kurtzman, "The Role Of Nurse Practitioners In Reinventing Primary Care," *Health Affairs*, 2010, 29(5):893-899.

59 Mary D. Naylor, Ellen T. Kurtzman, "The Role Of Nurse Practitioners In Reinventing Primary Care," *Health Affairs*, 2010, 29(5):893-899. Mary Mundinger, Robert L. Kane, Elizabeth R. Lenz, Annette M. Totten, Wei-Yann Tsai, Paul D. Cleary, William T. Friedewald, Albert L. Siu, Michael L. Shelanski, "Primary Care Outcomes in Patients Treated by Nurse Practitioners or Physicians," *Journal of the American Medical Association*, 2000, 283(1):59-68. Harold Sox, "Independent Primary Care Practice by Nurse Practitioners," *Journal of the American Medical Association*, 2000, 283(1):106-107.

60 National Conference of State Legislatures, "Scope of Practice Legislative Data Base, 2011-2012." National Conference of State Legislatures, "Scope of Practice Overview," June 13, 2013. Stephen Isaacs, Paul Jellinek, "Accept No Substitute: A Report on Scope of Practice," The Physicians Foundation, November 2012.

61 Stephen Isaacs, Paul Jellinek, "A Decision-Maker's Guide to Scope of Practice," The Physicians Foundation, October 22, 2012.

62 Douglas Brock, Shannon Bolon, Keren Wick, Kenneth Harbert, Paul Jacques, Timothy Evans, Athena Abdullah, F. J. Gianola, "The Military Veteran to Physician Assistant Pathway: Building the Primary Care Workforce," *Academic Medicine*, 2013, 88(12):1890-4.

63 Mary D. Naylor, Ellen T. Kurtzman, "The Role Of Nurse Practitioners In Reinventing Primary Care," *Health Affairs*, 2010, 29(5):893-899. Justin Altschuler, David Margolius, Thomas Bodenheimer, Kevin Grumbach, "Estimating a Reasonable Patient Panel Size for Primary Care Physicians With Team Based Delegation," *Annals of Family Medicine*, 2012, 10(5):396-400.

64 A nurse practitioner can bill 100 percent of the physician rate if he or she bills under a physician's provider number, and some states allow aligned payment for those practitioners.

65 David Margolius, Thomas Bodenheimer, "Transforming Primary Care: From Past Practice To The Practice Of The Future," *Health Affairs*, 2010, 29(5):5779-5784.

66 Thomas Bodenheimer, Hoangmai H. Pham, "Primary Care; Current Problems and Proposed Solutions," *Health Affairs*, 2010, 29(5):799-805.

67 Christine A. Sinsky, Rachel Willard-Grace, Andrew M. Schutzbank, Thomas A. Sinsky, David Margolius, Thomas Bodenheimer, "In Search of Joy in Practice: A Report of 23 High-Functioning Primary Care Practices," *Annals of Family Medicine*, 2013, 11(3):272-278.

68 Robert Wood Johnson Foundation, "Thirty Primary Care Practices Selected As Exemplary Models of Workplace Efficiency and Innovation," April 22, 2013. The Robert Wood Johnson Foundation-MacColl Center for Health Innovation at the Group Health Research Institute initiative began in 2012 to examine the practice patterns of 30 providers considered leaders in primary care innovation. LEAP (Learning from Effective Ambulatory Practices) providers represent a variety of locations, sizes, settings and configurations in 20 states. Institute for Health Care Improvement, "WIHI: New Staffing Models for Primary Care," October 10, 2013.

69 Carole W. Cranor, Barry A. Bunting, Dale B. Christensen, "The Asheville Project: Short Term Outcomes of a Community Pharmacy Diabetes Care Program," *Journal of the American Pharmacy Association*, 2003, 43(2):173-184. Jeanette L. Altavela, Matt K. Jones, Merrilee Ritter, "A Prospective Trial of a Clinical Pharmacy Intervention in a Primary Care Practice in a Capitated Payment System," *Journal of Managed Care Pharmacy*, 2008, 14(9):831-843.

70 Hoangmai H. Pham, Ann S. O'Malley, Peter B. Bach, Cynthia Saiontz-Martinez, Deborah Schrag, "Primary Care Physicians' Links to Other Physicians Through Medicare Patients: The Scope of Care Coordination," *Annals of Internal Medicine*, 2009,150(4):236-242.

71 Christine A. Sinsky, Rachel Willard-Grace, Andrew M. Schutzbank, Thomas A. Sinsky, David Margolius, Thomas Bodenheimer, "In Search of Joy in Practice: A Report of 23 High-Functioning Primary Care Practices," *Annals of Family Medicine*, 2013, 11(3):272-278. Institute for Health Care Improvement, "New Staffing Models for Primary Care," audio conference featuring Ed Wagner, Trissa Torres, Kirsten Meisinger, Thad Schilling, October 10, 2013.

72 Benjamin J. Chesluk, Eric S. Holmboe, "How Teams Work-Or Don't-In Primary Care: A Field Study on Internal Medicine Practices," *Health Affairs*, 2010, 29(5):874-879.

73 Institute for Health Care Improvement, "New Staffing Models for Primary Care," audio conference featuring Ed Wagner, Trissa Torres, Kirsten Meisinger, Thad Schilling, October 10, 2013.

74 Christine A. Sinsky, Rachel Willard-Grace, Andrew M. Schutzbank, Thomas A. Sinsky, David Margolius, Thomas Bodenheimer, "In Search of Joy in Practice: A Report of 23 High-Functioning Primary Care Practices," *Annals of Family Medicine*, 2013, 11(3):272-278.

75 Thomas Bodenheimer, Hoangmai H. Pham, "Primary Care: Current Problems and Proposed Solutions," *Health Affairs*, 2010, 29(5):5799-5805.

76 Mark W. Friedberg, Kathryn L. Coltin, Dana Gelb-Safran, Marguerite Dresser, Alan M. Zaslavsky, Eric C. Schneider, "Associations Between Structural Capabilities of Primary Care Practices and Performance on Selected Quality Measures," *Annals of Internal Medicine*, 2009, 151(7):456-463. Marci Nielsen, Nwando Olayiwola, Paul Grundy, Kevin Grumbach, "The Patient-Centered Medical Home's Impact on Cost & Quality, An Annual Update of the Evidence, 2012-2013," Patient Centered Primary Care Collaborative, January 2014. Ronald A. Paulus, Karen Davis, Glenn D. Steele, "Continuous Innovation in Health Care: Implications of the Geisinger Experience," *Health Affairs*, 2008, 27(5):1235-1245. Onur Asan, Enid Montague, "Physician Interactions with Electronic Health Records in Primary Care," *Health Systems*, 2012, 1(2):1-8.

77 Linda V. Green, Sergei Savin, Yina Lu, "Primary Care Physician Shortages Could Be Eliminated through Use of Teams, Nonphysicians and Electronic Communication," *Health Affairs*, 2013, 32(1):11-19.

78 Molly Porter, "Adoption of Electronic Health Records in the United States," Kaiser Permanente International, February 2013. Timothy K. Lake, Tricia C. Higgins, Paul B. Ginsburg, "Fostering Health Information Technology in Small Physician Practices: Lessons from Independent Practice Associations," National Institute of Healthcare Reform (NIHCR) Research Brief No. 5, June 2011.

79 Daniel R. Verdon, "Physician Outcry on EHR Functionality, Cost Will Shake the Health Information Technology Sector," *Medical Economics*, February 10, 2014.

80 Molly Porter, "Adoption of Electronic Health Records in the United States," Kaiser Permanente International, February 2013. Timothy K. Lake, Tricia Collins Higgins, Paul B. Ginsburg, "Fostering Health Information Technology in Small Physician Practices: Lessons from Independent Practice Associations," NIHCR Research Brief No. 5, June 2011.

81 U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services (CMS), "Comprehensive Primary Care Initiative." States include Arkansas, Colorado, New Jersey, New York, Ohio and Kentucky, Oklahoma and Oregon. In 2012, CMS launched the Comprehensive Primary Care Initiative — a four-year demonstration project involving 45 Medicare, Medicaid, and commercial insurers with 500 practices serving 300,000 patients in seven markets. Participating practices receive a risk-adjusted payment per member per month that ranges from $8 to $40 for the first two years, with lower payments in subsequent years. In the third and fourth year, practices have the opportunity to share in a portion of any savings derived in their market. Program participation requires providers to deliver intensive care management that includes individualized care plans, 24/7 accessibility, proactive preventive care and patient engagement, and HIT use to ensure care is provided across the medical neighborhood. U.S. Department of Health and Human Services, CMS," Multi-Payer Advanced Primary Care Practice Demonstration." States include Maine, Michigan, Minnesota, New York, North Carolina, Pennsylvania, Rhode Island and Vermont. An additional eight states, and 900,000 patients, are participating in the CMS Multi-Payer Advanced Primary Care Practice demonstration, which gives states flexibility to combine pay for performance incentives and/or shared savings alongside fee-for-service payments.

82 Group Health Cooperative, "Group Health Medical Centers Clinics Earn Highest Recognition Status for NCQA Medical Home," March 24, 2014.

83 Commonwealth Fund, "Group Health Cooperative: Reinventing Primary Care by Connecting Patients with a Medical Home," Case Study, July 2009.

84 Robert Reid, Katie Coleman, Eric A. Johnson, Paul A. Fishman, Clarissa Hsu, Michael P. Soman, Claire E. Trescott, Michael Erikson, Eric B. Larson, "The Group Health Medical Home at Year Two: Cost Savings, Higher Patient Satisfaction, and Less Burnout for Providers," *Health Affairs*, 2010, 29(5):835-843.

85 Mark W. Friedberg, Eric C. Schneider, Meredith B. Rosenthal, Kevin G. Volpp, Rachel M. Werner, "Association Between Participation in a Multipayer Medical Home Intervention and Changes in Quality, Utilization, and Costs of Care," *Journal of the American Medical Association*, 2014, 311(8):815-825.

86 Mark W. Friedberg, Eric C. Schneider, Meredith B. Rosenthal, Kevin G. Volpp, Rachel M. Werner, "Association Between Participation in a Multipayer Medical Home Intervention and Changes in Quality, Utilization, and Costs of Care," *Journal of the American Medical Association*, 2014, 311(8):815-825.

87 Susannah Higgins, Ravi Chawla, Christine Colombo, Richard Snyder, Somesh Nigam, "Medical Homes and Cost and Utilization," *American Journal of Managed Care*, 2014, 20(3):e61-e71.

88 Urvashi Patel, Carl Rathjen, Elizabeth Rubin, "Horizon's Patient-Centered Medical Home Program Shows Practices Need Much More than Payment Changes to Transform," *Health Affairs*, 2012, 31(9):2018-2027. Jaan E. Sidorov, "The Patient-Centered Medical Home for Chronic Illness: Is It Ready for Prime Time?" *Health Affairs*, 2008, 27(5):1231-1234. Deborah Peikes, Aparajita Zutshi, Janice L. Genevro, Michael L. Parchman, David S. Meyers, "Early Evaluations of the Medical Home: Building on a Promising Start," *American Journal of Managed Care*, 2012, 18(2):105-116. Thomas C. Rosenthal, "The Medical Home: Growing Evidence to Support a New Approach to Primary Care," *Journal of the American Board of Family Medicine*, 2008, 21(5):427-440.

89 Cynthia N. Rosenberg, "Results from a Patient-Centered Medical Home Pilot at UPMC Health Hold Lessons for Broader Adoption of the Model," *Health Affairs*, 2012, 31(11):2423-2431. Jill Bernstein, Deborah Chollet, Deborah Peikes, G. Gregory Peterson, "Medical Homes: Will They Improve Primary Care?" Mathematica Policy Research Issue Brief, June 2010.

90 Mark W. Friedberg, Eric C. Schneider, Meredith B. Rosenthal, Kevin G. Volpp, Rachel M. Werner, "Association Between Participation in a Multipayer Medical Home Intervention and Changes in Quality, Utilization, and Costs of Care," *Journal of the American Medical Association*, 2014, 311(8):815-825.

91 L&M Policy Research, Evaluation of CMMI Accountable Care Organization Initiatives, Contract HHSM-500-2011-0009i/HHSM-500-T0002, "Effect of Pioneer ACOs on Medicare Spending in the First Year," November 3, 2013.

92 Harold Miller, "From Volume to Value: Better Ways to Pay for Health Care," *Health Affairs*, 2009, 28(5):1418-1428.

93 Harold Miller, "From volume to value: better ways to pay for health care," *Health Affairs*, 2009, 28(5):1418-1428. Institute of Medicine, *Best care at lower cost: the path to continuously learning health care in America,* National Academies Press, 2013, 229.

94 Institute of Medicine, *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America,* National Academies Press, 2013, 229.

95 Donald Berwick, Andrew Hackbarth, "Eliminating Waste in US Health Care," *Journal of the American Medical Association*, 2012, (14):1513-1516.

96 Katie Merrell, Robert A. Berenson, "Structuring Payment for Medical Homes," *Health Affairs*, 2010, 29(5):852-858.

97 Availity, "Provider Attitudes Toward Value-Based Payment Models," An Availity Research Study, April 2014.

98 Stephanie Watson, "More Americans Using Retail Health Clinics," *Harvard Health Blog*, May 10, 2013.

99 RAND, "Use of Retail Medical Clinics Continues to Grow; Older Patients and Preventive Services on Rise," August 15, 2012.

100 Harris Interactive, "Popularity of 'Walk-In' Retail Health Clinics Keeps Growing: Poll," January 7, 2013.

101 Robin Weinick, Craig Pollack, Michael Fisher, Emily Gillen, Ateev Mehrotra, "Policy Implications of the Use of Retail Clinics," RAND Technical Report, 2010.

102 Ateev Mehrotra, Margaret Wang, Judith Lave, John Adams, Elizabeth McGlynn, "Retail Clinics, Primary Care Physicians, And Emergency Departments: A Comparison Of Patients' Visits," *Health Affairs*, 2008, 27(5):1272-1282.

103 Ateev Mehrotra, Judith Lave, "Visits to Retail Clinics Grew Fourfold from 2007 to 2009, Although Their Share of Overall Outpatient Visits Remains Low," *Health Affairs*, 2012, 31(9):2123-2129. RAND, "Use of Retail Medical Clinics Continues to Grow; Older Patients and Preventive Services on Rise," August 15, 2012. National Conference of State Legislatures, "Retail Health Clinics; State Legislation and Laws," September 2012.

104 RAND, "Health Care on Aisle 7, The Growing Phenomenon of Retail Clinics," Research Highlights, 2010.

105 RAND, "Health Care on Aisle 7, The Growing Phenomenon of Retail Clinics," Research Highlights, 2010. Ateev Mehrotra, Hangsheng Liu, John L. Adams, Margaret C. Wang, Judith R. Lave, N. Marcus Thygeson, Leif I. Solberg, Elizabeth A. McGlynn, "Comparing Costs and Quality of Care at Retail Clinics With That of Other Medical Settings for 3 Common Illnesses," *Annals of Internal Medicine*, 2009, 151(5):321-328. Michelle Lieker, "Retail Clinics: Coming to a Location Near You?" *Wisconsin Medical Journal*, 2006, 205(7):51-52.

106 Ateev Mehrotra, "Retail Clinics, Primary Care Physicians, and Emergency Departments: A Comparison of Patients' Visits," *Health Affairs*, 2008, 27(5):1272-1282. RAND, "Use of Retail Medical Clinics Continues to Grow; Older Patients and Preventive Services on Rise," 2012. National Conference of State Legislatures, "Retail Health Clinics: State Legislation and Laws," September 2012.

107 RAND, "Health Care on Aisle 7, The Growing Phenomenon of Retail Clinics," Research Highlights, 2010.

108 Craig E. Pollack, Courtney Gidengil, Ateev Mehrotra, "The Growth of Retail Clinics and the Medical Home: Two Trends in Concert or in Conflict," *Health Affairs*, 2010, 29(5):998-1003.

109 Tricia M. Leahey, Rajiv Kumar, Brad M. Weinberg, Rena R. Wing, "Teammates and Social Influence Affect Weight Loss Outcomes in a Team-based Weight Loss Competition," *Obesity*, 2012, 20(7):1413-1418. Jeffrey Bendix, Amanda Brower, "The Benefits of Sharing: Shared Medical Appointments Can Improve Your Patients' Outcomes and Your Practice's Efficiency," *Medical Economics*, 2011, 88(3):68-71.

110 Jeannette R. Ickovics, Trace S. Kershaw, Claire Westdahl, Urania Magriples, Zohar Massey, Heather Reynolds, Sharon Schindler Rising, "Group Prenatal Care and Perinatal Outcomes: A Randomized Controlled Trial," *Obstetrics and Gynecology*, 2007, 110(2):330-339.

111 Kelly B. Bartley, Rebecca Haney, "Shared Medical Appointments: Improving Access, Outcomes and Satisfaction for Patients with Chronic Cardiac Diseases," *Journal of Cardiovascular Nursing*, 2010, 25(1):13-19. Jeffrey Bendix, Amanda Brower, "The Benefits of Sharing: Shared Medical Appointments Can Improve Your Patients' Outcomes and Your Practice's Efficiency," *Medical Economics*, 2011, 88(3):68-71. Karen S. Yehle, Laura P. Sands, Patricia A. Rhynders, Gail D. Newton, "The Effect of Shared Medical Visits on Knowledge and Self-Care in Patients With Heart Failure: A Pilot Study," *Heart Lung*, 2009, 38(1):25-33.

112 Arne Beck, John Scott, Patrick Williams, Barbara Robertson, Deborah Jackson, Glenn Gade, Pamela Cowan, "A Randomized Trial of Group Outpatient Visits for Chronically Ill Older HMO Members: The Cooperative Health Care Clinic," *Journal of the American Geriatrics Society*, 1997, 45(5):543-549. Eric A. Coleman, Theresa B. Eilertsen, Andrew M. Kramer, David J. Magid, Arne Beck, Doug Conner, "Reducing Emergency Visits in Older Adults with Chronic Illness. A Randomized, Controlled Trial of Group Visits," *Effective Clinical Practice*, 2001, 4(2):49-57. Marina Trento, Pietro Passera, Marina Bajardi, Marco Tomalino, Giorgio Grassi, Enrica Borgo, C. Connola, Franco Cavallo, P. Bondonio, Massimo Porta, "Lifestyle Intervention by Group Care Prevents Deterioration of Type II Diabetes: A 4-year Randomized Controlled Clinical Trial," *Diabetologia*, 2002, 45(9):1231-1239. Marina Trento, Pietro Passera, Enrica Borgo, Marco Tomalino, Marina Bajardi, Franco Cavallo, Massimo Porta, "A 5-Year Randomized Controlled Study of Learning, Problem Solving Ability, and Quality of Life Modifications in People With Type 2 Diabetes Managed by Group Care," *Diabetes Care*, 2004, 27(3):670-675. John C. Scott, Douglas A. Conner, Ingrid Venohr, Glenn Gade, Marlene McKenzie, Andrew M. Kramer, Lucinda Bryant, Arne Beck, "Effectiveness of a Group Outpatient Visit Model for Chronically Ill Older Health Maintenance Organization Members: A 2-year Randomized Trial of the Cooperative Health Care Clinic," *Journal of the American Geriatrics Society*, 2004, 52(9):1463-1470. Jeannette R. Ickovics, Trace S. Kershaw, Claire Westdahl, Urania Magriples, Zohar Massey, Heather Reynolds, Sharon Schindler Rising, "Group Prenatal Care and Perinatal Outcomes," *Obstetrics and Gynecology*, 2007, 110(2 Pt 1):330-339. David Edelman, Sonja K. Fredrickson, Stephanie D. Melnyk, Cynthia J. Coffman, Amy S. Jeffreys, Santanu Datta, George L. Jackson, Amy C. Harris, Natia S. Hamilton, Helen Stewart, Morris Weinberger, "Medical Clinics Versus Usual Care for Patients With Both Diabetes and Hypertension: A Randomized Trial," *Annals of Internal Medicine*, 2010, 152(11):689-696. Susan Kirsh, Sharon Watts, Kristina Pascuzzi, Mary Ellen O'Day, David Davidson, Gerald Strauss, Elizabeth O. Kern, David C. Aron, "Shared Medical Appointments Based on the Chronic Care Model: A Quality Improvement Project To Address the Challenges of Patients With Diabetes With High Cardiovascular Risk," *Quality and Safety in Health Care*, 2007, 16(5):349-353. Shannon Cohen, Sarah Hartley, Jasbir Mavi, Bridgette Vest, Monica Wilson, "Veteran Experiences Related to Participation in Shared Medical Appointments," *Military Medicine*, 2012, 177(11):1287-1291. David Edelman, Jennifer R. McDuffie, Eugene Oddone, Jennifer M. Gierisch, John W. Williams Jr, Avishek Nagi, Liz Wing, "Shared Medical Appointments for Chronic Medical Conditions: A Systematic Review," Department of Veterans Affairs, Evidence-Based Synthesis Program, July 2012. Kathie Culhane-Pera, Kevin A. Peterson, A. Lauren Crain, Mayseng Lee, Bee Her, Tely Xion, "Group Visits for Hmong Adults With Type 2 Diabetes Mellitus: Pre-Post Analysis," *Journal of Health Care for the Poor and Underserved*, 2005, 16(2):315-327.

113 Susan L. Norris, Phyllis J. Nichols, Carl J. Caspersen, Russell E. Glasgow, Michael M. Engelgau, Leonard Jack Jr., Susan R. Snyder, Vilma G. Carande-Kulis, George Isham, Sanford Garfield, "Increasing Diabetes Self-Management Education in Community Settings: A Systematic Review," *American Journal of Preventive Medicine*, 2002, 22(4):39-66. Nicholas A. Christakis, James H. Fowler, "The Spread of Obesity in a Large Social Network Over 32 Years," *New England Journal of Medicine*, 2007, 357(4):370-379. Nicholas A. Christakis, James H. Fowler, "The Collective Dynamics of Smoking in a Large Social Network," *New England Journal of Medicine*, 2008, 358(21):2249-2258.

114 Jeannette R. Ickovics, Trace S. Kershaw, Claire Westdahl, Urania Magriples, Zohar Massey, Heather Reynolds, Sharon Schindler Rising, "Group Prenatal Care and Perinatal Outcomes: A Randomized Controlled Trial," *Obstetrics and Gynecology*, 2007, 110(2):330-339.

115 Raja Jaber, Amy Braksmajer, Jeffrey S. Trilling, "Group Visits: A Qualitative Review of Current Research," *Journal of the American Board of Family Medicine*, 2006, 19(3):276-290. Anna Gorman, "Group Meetings Turn Doctor Visits Inside Out," *Los Angeles Times*, September 13, 2013. Susan Kirsh, Sharon Watts, Kristina Pascuzzi, Mary Ellen O'Day, David Davidson, Gerald Strauss, Elizabeth O. Kern, David C. Aron, "Shared Medical Appointments Based on the Chronic Care Model: A Quality Improvement Project To Address the Challenges of Patients With Diabetes With High Cardiovascular Risk," *Quality and Safety in Health Care*, 2007, 16(5):349-353. Mary Ann Hodorowicz, "Reimbursement for Shared Medical Appointments Incorporating Diabetes Self-Management Education/Training or Diabetes Medical Nutrition Therapy," *Diabetes Spectrum*, 2012, 25(2):84-90.

116 Victoria Stagg Elliott, "Group Appointments Can Serve Both Patients and Practices," *American Medical News*, September 19, 2011.

117 Robert Greene, Edwin Dasso, Sam Ho, Jerry Frank, Graeme Scandrett, Ash Genaidy, "Patterns and Expenditures of Multi-Morbidity in an Insured Working Population in the United States: Insights for a Sustainable Health Care System and Building Healthier Lives," *Population Health Management*, 2013, 16(6):381-9.

118 Steven Cohen, Namrata Uberoi, "Differentials in the Concentration in the Level of Health Expenditures across Population Subgroups in the U.S., 2010," *Statistical Brief #42*, Agency for Healthcare Research and Quality, Rockville, MD, August 2013. Steven Cohen, William Yu, "The Concentration and Persistence in the Level of Health Expenditures over Time: Estimates for the U.S. Population, 2008-2009," *Statistical Brief #354*, Agency for Healthcare Research and Quality, Rockville, MD, January 2012.

119 Steven Cohen, Namrata Uberoi, "Differentials in the Concentration in the Level of Health Expenditures across Population Subgroups in the U.S., 2010," *Statistical Brief #42*, Agency for Healthcare Research and Quality, Rockville, MD, August 2013.

120 Jianying Hu, Fei Wang, Jimeng Sun, Robert Sorrentino, Shahram Ebadollahi, "A Healthcare Utilization Analysis Framework for Hot Spotting and Contextual Anomaly Detection," American Medical Informatics Association Annual Symposium Proceedings, 2012.

121 Tracy Yee, Amanda E. Lechner, Emily Carrier, "High-Intensity Primary Care: Lessons for Physician and Patient Engagement," National Institute for Health Care Reform, Issue Brief No. 9, October 2012.

122 Michael E. Porter, Erika A. Pabo, Thomas H. Lee, "Redesigning Primary Care: A Strategic Vision to Improve Value by Organizing Around Patients' Needs," *Health Affairs*, 2013, 32(3):517-523.

123 Agency for Healthcare Research and Quality, U.S. Department of Health and Human Services, Prevention Quality Indicators Technical Specifications - Version 4.5, March 2013.

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