SPECIAL COMMUNICATION

How Evolving United States Payment Models Influence Primary Care and Its Impact on the Quadruple Aim

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Introduction: **Prior research has demonstrated the associations between a strong primary care foundation with improved Quadruple Aim outcomes. The prevailing fee-for-service payment system in the United States reinforces the volume of services over value-based care, thereby devaluing primary care, and obstructing the health care system from attaining the Quadruple Aim. By supporting a shift from volume-based to value-based payment models, the Medicare Access and Children's Health Insurance Program Reauthorization Act may help fortify the role of primary care. This narrative review proposes a taxonomy of the major health care payment models, reviewing their ability to uphold the functions of primary care, and their impacts across the Quadruple Aim.**

Methods: **An Ovid MEDLINE search and expert opinion from members of the Family Medicine for America's Health payment and research tactic teams were used. Titles and abstracts were reviewed for relevance to the topic, and expert opinion further narrowed the literature for inclusion to timely and relevant articles.**

Findings: **No payment model demonstrates consistent benefits across the Quadruple Aim across a limited evidence base. Several cross-cutting lessons from available payment models several recommendations for primary care payment models, including the following: implementing per member per month–based models, validating risk-adjustment tools, increasing investments in integrated behavioral health and social services, and connecting payments to patient-oriented and primary care-oriented metrics. Along with ongoing research in emerging payment models, data systems integrated across health care and social services settings using metrics that can capture the ideal functions of primary care will be critical to the development of future payment models that most optimally enhance the role of primary care in the United States.**

Conclusions: **Although the ideal payment model for primary care remains to be determined, lessons learned from existing payment models can help guide the shift from volume-based to value-based care. To most effectively pay for primary care, future payment models should invest in a primary care infrastructure, one that supports team-based, community-oriented care, and measures the delivery of the functions of primary care. (J Am Board Fam Med 2018;31:588–604.)**

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Forty years ago, in the milestone "Declaration of Alma Ata," all member nations of the World Health Organization declared that achieving health for all was dependent on a foundation of primary care.[1] A quarter century later, Dr. Barbara Starfield added to the evidence base, demonstrating that primary care produces higher quality of care, im-

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Figure 1. The 4 Cs of Primary Care.

- **Contact**: Accessibility as the first contact with the health care system
- **Comprehensiveness**: Accountability for addressing a vast majority of personal health care needs,
- **Coordination**: Coordination of care across settings, and integration of care for acute and (often comorbid) chronic illnesses, mental health, and prevention, guiding access to more narrowly focused care when needed,
- **Continuity**: Sustained partnership and personal relationships over time with patients known in the context of family and community.

proves health outcomes, increases access, lowers costs, and attenuates disparities.[2,3,4] She attributed the positive impact of primary care on health systems to the "4 Cs," which define its function: first contact, continuity, comprehensiveness, and coordination (Figure 1).[4] Subsequent research has demonstrated that supporting these 4 Cs are the elements of primary care that help health systems achieve the Quadruple Aim of improving patients' experience of care, population health, and physician satisfaction, while reducing costs.[5,6,7,8]

Starfield's work and the healthcare system's longstanding inattention to primary care may explain the ongoing failure of the United States to achieve its Quadruple Aims, given the inadequate system level support for primary care.[9,10,11,12,13,14] Its predominant fee-for-service (FFS) payment model has long been thought to undermine or insufficiently support the 4 Cs that explain primary care's positive effects.[15,16,17] Under pure FFS payment models, clinicians are reimbursed retroactively for services, incentivizing higher volume, treatment rather than prevention, and fragmentation of care without regard for quality or cost. Such models reward greater numbers of services rendered (ie, volume) rather than the quality and cost of care provided to patients (ie, value).[18,19]

Payers, public and private, are experimenting with shifting from paying for volume to paying for value. The Affordable Care Act included provisions that advance primary care and value-based payment, including the creation of the Center for Medicare and Medicaid Innovation (CMMI), which has tested innovative payment and delivery system models aimed at improving value.[20,21,22] Five years after the Affordable Care Act, the Medicare Access and Children's Health Insurance Program CHIP Reauthorization Act (MACRA) passed. Under MACRA, providers[1] will select 1 of 2 incentive tracks: the alternative payment model (APM; see Table 1) or the Merit-Based Incentive Payment System (see Table 2).[23] Both programs provide incentives for improving quality and reducing costs.

As value-based payment spreads, better understanding of existing models can guide which approaches deserve ongoing implementation and research efforts. This narrative review of the literature proposes a taxonomy of the major health care payment models, highlights their distinguishing characteristics (Table 3), and reviews their impacts across the Quadruple Aim (Table 4). We also discuss the impact of each payment model in supporting the 4 Cs of primary care; given the lack of widespread use and standardized metrics in measuring these pri-

[1]Eligible clinicians provide care for at least 100 Medicare patients *and* bill for greater than $30,000 of Medicare Part B services.

Table 1. Scheduled Adjustments in APM Eligibility Criteria under Medicare Access and Children's Health Insurance Program Reauthorization Act

Year	Eligibility
2019 and 2020	≥25% of total Medicare revenue is from a qualified, eligible APM
2021 and 2022	≥50% of total Medicare revenue OR
	≥25% of total Medicare revenue and 50% of all-payer revenue (eg, Medicaid, private insurers) is from a qualified, eligible APM
2023 and beyond	≥75% of total Medicare revenue OR
	≥25% of total Medicare revenue and 75% of all-payer revenue is from a qualified, eligible APM

APM, alternative payment model; OR, odd ratio.

Table 2. Scheduled Payment Adjustments in Merit-Based Incentive Payment System

Adjustment	2019	2020	2021	2022 and beyond
Baseline payment adjustment	±4%	±5%	±7%	±9%
Maximum payment adjustment for high performers	+12%	+15%	+21%	+27%

mary care attributes[24], when relevant, we consider the hypothetical impacts of each model when formal metrics were not used. Based on these findings, we provide policy and research recommendations for payment reform to best advance primary care.

Methods

Starfield Summit I: Advancing Primary Care Research, Policy, and Patient Care

The first iteration of this narrative review was conducted before the inaugural Starfield Summit (http://www.starfieldsummit.com) on April 24 to 26, 2016, in Washington, D.C. It was intended to inform and capture informant input from the Summit's nearly 150 invited primary care leaders (PCPs), researchers, and health care leaders to discuss and enable research and policy agenda-setting around primary care payment, measurement, and teams.[25]

Literature Review

We first conducted a literature search[26] on primary care payment, enriched through expert consultation before, during, and after the Summit. In March 2016, an Ovid MEDLINE search was conducted using the search terms "payment" and "primary care." The search was limited to articles published in English since 2010, yielding a total of 391 results[2], with 97 articles ultimately included in the review. Exclusion criteria included the following: inclusion in a subsequent systematic review, updated evidence available (ie, more recent article from the same demonstration), not focused on payment models, not focused on Quadruple Aim and/or the 4 Cs, and non-US evaluations that were subnational. Additional articles and gray literature were identified from the expert opinions of members of the Family Medicine for America's Health payment and research tactic teams and a "snowball" method of reviewing the references of the search results. The literature was summarized for each model, and key demonstrations or projects were selected, with agreement from at least 2 authors from the writing group, to highlight examples.

Results

Fee-For-Service

Under FFS, a provider is retrospectively paid a predefined amount for each service. Consequently, providers are incentivized to increase volume without bearing financial risk for quality or costs; insurers bear high financial risk in this arrangement. In 1992, the Centers for Medicare and Medicaid Services (CMS) began using the Resource-Based Relative Value Scale to set a fee schedule for different services, which has been criticized for disproportionately weighing specialist care and procedures over primary care.[27,28] Despite concerns over the limitations of FFS, its inclusion in a payment model may enhance the use of services that are low-cost and underutilized[29], such as vaccines in low immunization areas, where increased volume is desirable for population health.

Traditional (Or Full-Risk) Capitation

In response to rising costs from FFS, health maintenance organizations (HMOs)[3] emerged in the 1980s to coordinate care and reduce use[30] by capitating payments.[26] In traditional capitation, providers are paid a prospective amount to cover all services within a specific period of time, most often as a per member per month (PMPM) fee. Payments vary by age-group and sex and are determined based on prior average costs of care under FFS.[31,32] A capitated fee can cover all primary care services, all outpatient services, or all health care services,

[2]In the case that a more recent report on a demonstration project was published between the time of the initial literature search and submission of this manuscript, we replaced the prior report with the most up-to-date evidence.

[3]HMOs and other managed care models also include other mechanisms for cost control (e.g., narrow provider networks and pre-authorization of services). For the purposes of this paper, we have examined this model as a surrogate for capitated payment, though we acknowledge other mechanisms were in place to contribute to outcomes.

Table 3. Overview of Primary Care Payment Models

	Description	Prospective vs retrospective	Financially discourages volume of services?	Financially encourages high quality of care?	Party that primarily bears the financial risk?	Risk adjusts for patient complexity?	Key Example
Fee-for-service (FFS)	Paid for each individual service rendered	Retrospective	No	No	Insurers Patients (via cost-sharing: co-pays, deductibles)	No	Medicare
Traditional capitation (full-risk capitation, global payment)	Paid to cover all services within a specific period of time	Prospective	Yes	No, except for outcomes related to use	Primary care practices	No	Medicare Advantage HMOs
Pay-for-performance (P4P) exists in addition to underlying model (generally FFS or capitation)	Paid for achievement of (or improvement in) a quality measure	Both exist (most models retrospectively; however, can be paid prospectively and subsequently reconciled)	Potentially (depends on quality metrics)	Yes, for services being measured via quality metric	Depends on underlying payment model Primary care practices, if targets not met	Potentially	Medicare Physician Group Practice Demonstration Project
Bundled payment (episode-of-care)	Paid for all services rendered for a given episode of care	Mixed (generally retrospectively triggered and prospectively paid)	Yes (but does not discourage volume of episodes)	No, except for outcomes related to utilization	Primary care practices, organizations	No	CMMI's Bundled Payments for Care Improvement
Shared savings	Paid based on spending below a predetermined benchmark over a period of time (contingent on meeting certain quality targets)	Mixed (prospective at level of the ACO, but providers often still paid via FFS)	Yes	Yes	ACOs	Potentially	Medicare Shared Savings Program ACOs
Blended FFS and capitation	Paid a predetermined amount intended to cover medical home services for a specific period of time in addition to FFS	Mixed	No (to the extent that FFS is the predominant payment mechanism)	No	Depends on underlying payment model	Potentially	Medicare Comprehensive Primary Care Initiative
Comprehensive (primary) care payment	Paid a risk-adjusted amount to cover all primary care services for a specific period of time; includes component of P4P	Prospective	Yes	Yes	Primary care practices	Yes	Iora Health

Continued

Table 3. Continued

	Description	Prospective vs retrospective	Financially discourages volume of services?	Financially encourages high quality of care?	Party that primarily bears the financial risk?	Risk adjusts for patient complexity?	Key Example
Direct primary care	Paid outside of third-party insurers (often directly from patients) a predetermined amount to cover all primary care services for a specific period of time	Prospective	Yes	No	Primary care practices for primary care expenses Patients for other aspects of care (and insurers if patients have third party insurance)	No	Qliance

ACO, accountable care organization; HMO, health maintenance organization; CMMI, Center for Medicare and Medicaid Innovation.

including inpatient and outpatient. In contrast to FFS, capitation incentivizes cost control. Capitation may also exist as part of blended models with mixed PMPM payments and FFS, or in a further risk-adjusted form mixed with pay-for-performance in comprehensive primary care payment; these models are discussed in a later section. In contrast to FFS, capitation shifts financial risk to the provider, while the payer has lower risk.

One study examined the impact of capitation on one of the 4 Cs and finding capitated models was associated with decreased first contact (access).[33] This may reflect the incentive for providers to avoid sicker patients (termed adverse selection or "cherry-picking") to reduce costs. Another possible negative impact on the 4 Cs is a financial incentive to inappropriately underdeliver services, leading to decreased comprehensiveness.[34] The prospective element of capitation could benefit primary care by enabling upfront investments in practice components that enhance the 4 Cs (eg, care coordination) and providing flexibility for practices to determine how finances are spent.

Traditional capitation has demonstrated mixed effects on cost and quality[35,36,37], although most evidence suggests a decreased use of hospitals and other expensive resources and worse patient satisfaction, consistent with the backlash toward HMOs in the 1990s.[38]

Pay-For-Performance (P4P)

P4P supplements an underlying payment model, most often as a bonus on top of FFS. P4P refers to payment based on the achievement of a quality target (eg, hemoglobin A1c [HbA1c] level <8 for diabetic patients or delivery of cancer screening) or improvement in performance (eg, change from baseline for HbA1c); the latter approach may attenuate variation in quality across providers, and provide incentives for both high-performing and low-performing practices.[39]

Limited evidence exists for the impact of P4P on the 4 Cs. The United Kingdom's Quality and Outcomes Framework (QOF) found decreased continuity rates and no differences in patient-reported perception of coordination, when compared with preintervention periods.[40] Incentivized metrics tended to improve, whereas nonincentivized metrics demonstrated unchanged or worsened rates of improvement; a limited set of targeted metrics could thus inhibit the comprehensive function of

Table 4. Impact of Primary Care Payment Models on the Quadruple Aim and Tenets of Primary Care

Payment Model	Quadruple Aim				Allows Proactive Investment in Primary Care	The 4 Cs of Primary Care				Elements Associated with Successful Programs
	Health Outcomes	Experience of Care	Cost Control	Provider Satisfaction		Contact (Access)	Continuity	Coordination	Comprehensiveness	
Fee-for-service (FFS)	↓	↓	↓	↓	×	↓	←→	↓	↑ ↓*	Billing mechanisms available that recognize primary care tenets and non-face-to-face services
Traditional (full-risk) capitation	←→	Mostly ↓	Mostly ↑	↓	✔	↓	Insuff. evidence	Insuff. evidence	↑ ↓	Risk limited to primary care services PMPM determination based on anticipated need rather than FFS*
Pay-for-performance (P4P)	↓ ↑	↓ ↑	↓ ↑	↓	×	↓ ↑	↓	←→	↓	Appropriate, aligned measures for use in primary care*
Bundled payment (episode-of-care)	←→ (weak)	Insuff. evidence	Insuff. evidence	Insuff. evidence	✔/× (retroactively triggered)	Insuff. evidence	Insuff. evidence	↑ (weak)	Insuff. evidence	N/A, may not apply to primary care given difficulty defining and assigning bundles
Shared savings	↑	↑	↓ ↑	Insuff. evidence	✔/× (providers often paid FFS)	Insuff. evidence	Insuff. evidence	↑*	Insuff. evidence	Target high-needs patients Address psychosocial needs Appropriate risk-adjustment Non-FFS incentives at provider level* Physician-led or integrated ACO

Continued

Table 4. Continued

Payment Model	Quadruple Aim: Health Outcomes	Quadruple Aim: Experience of Care	Quadruple Aim: Cost Control	Quadruple Aim: Provider Satisfaction	Allows Proactive Investment in Primary Care	The 4 Cs of Primary Care: Contact (Access)	The 4 Cs of Primary Care: Continuity	The 4 Cs of Primary Care: Coordination	The 4 Cs of Primary Care: Comprehensiveness	Elements Associated with Successful Programs
Blended FFS and capitation	↓ ↑	↓ ↑	↓ ↑	Insuff. evidence	✔/✕	↑	↑	↑	Insuff. evidence	Target high-needs patients Appropriate risk-adjustment Multipayer alignment Real-time data sharing Optimal FFS/capitation blend (more research needed)
Comprehensive primary care payment	↑ (weak)	↑ (weak)	↑ (weak)	↑ (weak)	✔	↑ (weak)	Insuff. Evidence	Insuff. evidence	↑ (weak)	Appropriate risk adjustment Payments based on 10% total cost of care rather than prior FFS
Direct primary care	Insuff. evidence	↑ (weak)	↑ (weak)	↑ (weak)	✔	↓ ↑* (better indiv. access, but affordability and workforce concerns)	Insuff. evidence	Insuff. evidence	Insuff. evidence	Coupling with appropriate wraparound insurance to avoid high patient costs for non-primary care services*

↑, evidence of positive outcomes.
↓, evidence of negative outcomes.
↓ ↑, evidence of mixed effects.
⟷, no significant effect or change.
✔, allows proactive investment in primary care.
✕, does not allow proactive investment in primary care.
✔/✕, some components allow proactive investment in primary care, while others do not.
Insuff. evidence, no available evidence; (weak), limited or poor quality evidence (ie, ≤1 study examined and/or not a comparison study).
*No or limited evidence, but a strong theoretical likelihood of effect.
Proactive investment in primary care can support all of the 4 Cs.
ACO, accountable care organization; PMPM, per member per month.

primary care.[41,42] P4P targeted to the 4 Cs could hypothetically support primary care; however, current metrics focus predominantly on disease-focused and process-oriented outcomes (eg, HbA1c) outcomes, rather than patient-centered outcomes (eg, quality of life) or primary care attributes (eg, continuity).[41,43] Metrics for the latter remain underdeveloped and under used,[42] despite growing recognition of the importance of measuring the 4 Cs.[45] As P4P is a bonus payment, the shortcomings of the underlying payment model often prevail.

Overall, the evidence supporting P4P has been mixed, with inconsistent impacts across the Quadruple Aim.[41,45,46,47,48,49,50] In 2 large systematic reviews, 1 from QOF and 1 from the United States, some modest yet positive impacts on rate of improvement for targeted quality and patient outcomes were observed initially, but these benefits stagnated over time, if not regressed to preintervention rates.[41,51] Providers reported decreased patient-centered care and continuity[41], which are important predictors of provider satisfaction.[52] The return on investment of P4P may be low, given significant time and financial costs of implementation.[53]

Bundled Payment/Episode-of-Care Payment

Under bundled payment, providers receive a predetermined payment for all services rendered for an episode-of-care; this payment may be provided prospectively or retrospectively. This model has been used in hospitals (ie, Diagnosis Related Groups), which receive a set fee for services (ie, labor and delivery). As with capitation, providers are at financial risk if their costs exceed the fee but profit from cost savings. Bundled payments may be optimal for high-cost, low-frequency conditions or episodes (eg, hip fractures), as there is incentive to limit the costs for the given episode, but not to limit future episodes.[30]

Limited evidence exists of the impact of bundled payment on the 4 Cs. As reimbursements for an episode of care are bundled for multiple providers, coordination across specialties is encouraged[54], with improvements demonstrated in a Netherlands bundled-payment initiative.[55] Like capitation, global payment could support the 4 Cs by enabling investment in a strong primary care infrastructure. Unfortunately, bundled payments can be difficult to implement in primary care due to issues around defining episodes of care. Although acute conditions like fractures and pregnancy have clearer beginning and end points, defining what constitutes a chronic condition episode is more challenging, a problem amplified in patients with multiple chronic conditions. Furthermore, as a retrospectively triggered but prospectively defined fee, bundled payment shares some of the disadvantages of both FFS and capitation. Though costs may be saved within episodes, there is a financial incentive to increase episodes, similar to FFS. Because financial incentives are predicated on savings, there may be a disincentive to care for sicker patients.

Although Diagnosis Related Groups decrease overall health care expenditures[56], evidence for the use of bundled payments in primary care is limited. This was evaluated in a 2006 pilot, where none of the primary care sites were able to implement the model over 3 years due to challenges in defining an episode and identifying and tracking included services based on FFS claims.[57] Data from the Netherlands suggest no significant impact on quality[58]; otherwise there is a paucity of evidence for bundled payment outside of an acute care setting.[59] In summary, there is a lack of evidence on the impact of bundled payments in primary care on the Quadruple Aim, possibly because the model may not be applicable to that setting.

Shared Savings

Under shared savings, providers or an accountable care organization (ACO) are responsible for the costs and quality of care for a defined population through the provision of a global budget.[60] Most often, the global budgets are calculated based on expenditures from prior years and supplied by insurers as a risk-adjusted PMPM.[61] Expenditures at the end of 1 year are compared against a benchmark, which are also often calculated from expenditures from prior years. Risk arrangements can be 1-sided, where the ACO or equivalent group is eligible for shared savings if their costs are below the benchmark and they meet predetermined quality targets; or they can be 2-sided, where they are also at risk of penalty if they exceed the benchmark.[62] As with other global budget arrangements (eg, capitation, bundled payment), the 2-sided arrangement shifts some financial risk from payers to the ACO.

Our review of shared savings models found few evaluations offering insights into their impact on the 4 Cs. Like other models using global payments,

shared savings theoretically allows ACOs to invest upfront in a primary care infrastructure. Like bundled payment, because cost savings are shared across provider groups, shared savings could improve coordination.[63] Shared savings, as it has been operationalized thus far, may present limitations for primary care. First, because benchmarks are often calculated from expenditures from previous time periods, inefficient, high-spending providers could be rewarded, while high-functioning, coordinated practices delivering comprehensive care could receive comparably lower payments. Second, due to the payment lag from distributing cost savings retrospectively at the end of the year, practices may not be able to invest this money upfront in services that deliver on primary care functions. Finally, despite being paid by a global budget, many ACOs continue to reimburse their providers based on FFS[64,65], limiting both the effectiveness of the model and the benefits reaped at the provider level.

The most significant data examining shared savings are the preliminary results of 2 CMMI initiatives: the Medicare Shared Savings Program (MSSP; with results currently available for its third performance year) and the Pioneer ACO (with results currently available for its fourth performance year).

In 2015, 392 organizations participated in MSSP; there were 12 participating organizations in the Pioneer ACO program. Although 31% of MSSP and Pioneer ACO practices earned shared savings, the programs operated at a net loss of $216 million to CMS after accounting for bonus payments.[66] The majority of quality measures improved in 2015.[67] There was no significant correlation between quality performance and cost savings in the MSSP.[68] Cost savings were more likely in ACOs that were smaller and physician-led or integrated (physician-hospital partnership), had been participating in the program longer, and had higher benchmarks. As with many other programs, although the ACO is paid through a global budget, many providers continue to be paid via FFS.[69,65]

Hennepin Health, a safety-net ACO serving Medicaid enrollees in Minnesota, is a partnership between federally-qualified health centers, the county hospital, the county health department, and a nonprofit HMO.[63] The ACO's model centers around interdisciplinary primary care teams, and the flexibility of PMPM funds under the global budget has been used to address a broader set of patients' needs, including behavioral health care and social services. Early results demonstrate decreased emergency department (ED) visits improved quality of chronic disease care and high patient satisfaction.[63] Approximately $3 million in savings over 3 years has been reinvested in interventions to meet social needs.[63]

Across the Quadruple Aim, shared savings seems to have positive impacts on quality of care and mixed results on costs; cost savings have been observed in particular when there is physician leadership in the ACO, the ACO has been in existence for a longer period of time, and care coordination and inclusion of nonmedical services are emphasized. Continued FFS payments at the provider level may limit benefits.

Blended FFS and Capitation

Capitated PMPM payments are given in addition to FFS in the form of care management fees, care coordination fees, or patient-centered medical home (PCMH) payments in blended payment models. These fees are intended to finance PCMH infrastructure, staffing, and services not covered by reimbursement for traditional office visits, particularly activities that coordinate care across the health care system. These fees may be adjusted to diminish the risk of cherry-picking. By adjusting payment systems that are already in place, blended FFS and capitation may present fewer barriers to widespread implementation than models that require systemic overhaul.

The largest source of emerging evidence regarding impact of blended FFS and capitation in the primary care setting comes from 2 large Medicare demonstration projects: the Comprehensive Primary Care Initiative (CPCI) and the Multi-Payer Advanced Primary Care Practice (MAPCP). In the third year of CPCI, improvements in care access and continuity were observed.[70] The capitated PMPM payments could allow practices to proactively invest in an infrastructure that supports primary care, and practices implementing risk-adjustment could guard against cherry-picking. As capitation and FFS often have opposite effects, blending the 2 models could mitigate the shortcomings of each; however, as the PMPMs supporting PCMH services are often disproportionately smaller than FFS payments[71], the incentive for higher volumes of services may predominate.

Results from the first 3 years of CPCI, encompassing 445 primary care practices, over 2100 providers, and nearly 2.9 million patients in 7 regions, show practices have not yet achieved cost savings.[72] Statistically significant reductions were noted in expenditures for skilled nursing facilities (5%), primary care services (2%), and outpatient services (2%). ED visits were significantly reduced in the CPCI group, but decreases in hospitalization did not reach statistical significance. However, after including care management fees, Medicare expenditures increased by $7 PMPM more for CPCI than comparison practices. Most quality of care measures did not change, with the exception of small improvements in some measures of diabetes care quality and likelihood of ED revisit.

The MAPCP demonstration project started in 2011, involving 8 states, approximately 850 primary care practices, over 6300 providers, and about 712,000 Medicare beneficiaries.[70] In all 8 states, Medicare, Medicaid, and private health plans are participating. Preliminary results from the second (with cost saving estimates) and third year are available for MAPCP. Only Michigan demonstrated significant net savings after accounting for demonstration fees paid out to each state for MAPCP participation. Significant heterogeneity in PMPM payments exists among the MAPCP group, ranging from $1.20 to $60.81.[70]

Quality outcomes and utilization for MAPCP have been mixed. In the second year evaluation, 5 out of 8 states had some improvement in guideline-recommended services for diabetes, while in 2 states these measures declined.[70] Similarly, in 6 out of 8 states, there were no significant differences found in preventable hospitalizations; in 2 states, there were increases observed.[70] In the third year, some commercial payers and Medicaid in New York and Vermont reported reductions in hospitalizations and ED visits, with some payers finding a decrease in total PMPM costs.

Other studies in our review found similarly mixed Quadruple Aim outcomes for blended FFS and capitation models.[73,74,75,76] Commonalities across more effective programs include being in place for a longer period of time, multipayer alignment[77], focusing on high-cost patients[78,79,80,81], and investing in population health data systems that provide real-time information on health care use.[80,81,82] Some experts have suggested blended FFS and capitation as a transition to fully global budgets.[83,84]

Comprehensive Primary Care Payment

Like traditional capitation, under comprehensive primary care payment, insurers provide a prospective payment to cover all primary care services within a specific period of time (eg, PMPM). Rather than basing capitated payments on historic FFS reimbursements, these payments are calculated to account for the delivery of primary care services and costs necessary to support medical homes. To address cherry-picking, comprehensive primary care payments are risk-adjusted based on patient complexity and include a component of P4P to address concerns about potential inappropriate under use of services. Furthermore, PCPs are financially responsible for primary care expenditures rather than total costs, relieving some of the financial risk seen in traditional capitation and transferring part of the risk to payers[30]; however, providers continue to maintain some financial accountability.

Relatively little evidence exists for the impact of comprehensive primary care payment on the Quadruple Aim or the 4 Cs. Like other prospective models, the model allows for flexible, proactive investments in a primary care infrastructure that could support the 4 Cs. Unlike traditional capitation, however, the risk-adjustment of comprehensive primary care payment may guard against cherry-picking and continue to facilitate access for high-complexity patients. Although the capitated model could hinder comprehensive care by incentivizing underdelivery of services, linkages to quality of care in this model through P4P, if appropriate measures for primary care are employed, could hypothetically guard against inappropriate underdelivery of care.

Most of the evidence on comprehensive primary care payment comes from Iora Health[4], a national network of primary care practices, which receives a fixed, risk-adjusted PMPM from large self-insured employers, unions, or insurers, and incorporates additional payments for meeting quality or use targets.[85,86] Ten percent of the total cost of care is invested in primary care services, roughly doubling

[4]Iora Health has also opened one DPC practice; a second DPC practice, Turntable Health, closed in January 2017.

the percentage the US health care system spends on primary care.[87] These primary care investments enable Iora to redesign care delivery, such as increasing access (eg, same-day appointments, e-mail contacts) and comprehensiveness (eg, personal health coaches).[90] Furthermore, the group developed its own electronic health record to enhance quality monitoring and performance feedback. There have not been independent evaluations of outcomes, but Iora reports increased patient and provider satisfaction, improvements in blood pressure and HbA1c, a 12.3% decrease in health care expenditures, a 48% reduction in ER visits, and a 41% reduction in inpatient admissions.[85,88]

Direct Primary Care (DPC)

DPC has emerged as a model outside of the insurance system attempting to reorganize both the delivery and payment of health care to enable the primary care function.[4] In DPC, patients pay the provider directly, without third-party billing; definitions vary on whether or not employers paying providers directly also fall under this model. Patients are charged a fixed, age-adjusted monthly fee for all their primary care, independent of preexisting medical conditions.[89] Common ancillary services are generally provided as part of the monthly fee, including on-site lab tests, x-rays, and electrocardiograms.

There is limited evidence on the potential impact of DPC on specific primary care functions. DPC providers have increased visit lengths (typically 30 minutes to 60 minutes per visit), which could support coordination of care and allow for greater comprehensiveness.[90] Decreased volume of face-to-face visits has increased time for access via e-mail and telephone communications.[91] As with other prospective payment models not linked to volume, DPC grants practices the flexibility to invest revenue in nonvisit-based services that support primary care.

Some concerns have emerged about the ways DPC could inhibit the 4 Cs. First, there is the potential for high cost-sharing[90], as the DPC fee covers only outpatient primary care services. Second, DPC may limit access for individuals of lower socioeconomic status, although DPC groups have explored arrangements with Medicaid to cover these patients (by definition, however, this would no longer constitute a DPC payment arrangement).[89] Because DPC panels are one-fifth the size of non-DPC providers, there are concerns that expanding the model would decrease access by compounding the PCP shortage.[90]

Like comprehensive primary care, few studies exist that examine the impact of DPC on the Quadruple Aim. Most of the available evidence comes from Qliance, a Seattle-based DPC network. Qliance reported 35% fewer hospitalizations, 65% fewer ED visits, and 66% fewer specialist visits.[92] In addition, they estimated cost savings of 19.6% per patient per year and scored at the 95th percentile for patient experience.[93] Qliance recently closed its doors due to financial difficulties, raising concerns about the financial sustainability of DPC, although this may be related to efforts to rapidly scale the model.

Discussion

Our review identified 8 distinct payment models which differentially shape primary care delivery in the United States: FFS, traditional capitation, P4P, bundled payment, shared savings, blended FFS and capitation, comprehensive primary care payment, and DPC; many payers use combinations of these models. Each model is currently in various stages of implementation, with significantly less evidence available for newer models.

Few studies examined the impact of payment models on the 4 Cs of primary care. Nonetheless, several key characteristics were consistently noted. First, payment models can be viewed along a spectrum from FFS (retrospective) to capitated (prospective) payment. Whereas retrospective payment may incentivize the delivery of services, prospective payments offer flexibility for primary care practices to invest in services and infrastructure that can enhance the 4 Cs, such as nursing follow-up calls to enhance coordination, same-day appointments to improve access, and integrated behavioral health for more comprehensive care. Second, because capitated models may encourage adverse selection and underdelivery of appropriate services, risk-adjustment may be used to preserve the primary care attributes of access and comprehensive care, respectively. Third, P4P has been used as a bonus to

[5]DPC differs from concierge medicine in that concierge practices continue to bill insurance for services, but also charge a retainer (usually annually, and significantly higher than DPC payments) to patients.

incentivize quality; however, measures are largely disease-oriented and generally do not assess the tenets of primary care or patient-centered outcomes. Finally, newer payment models have prioritized sufficient funds to support primary care services that uphold the 4 Cs, but inpatient and specialty services are paid for separately. Although in a prospective payment model this may reduce the financial risk to providers, ongoing research will be needed to assess whether doing so limits coordination (eg, incentives not aligned across primary care and specialty care, or inpatient and outpatient settings). Studies that examine the role of and optimal payment for PCMHs within ACOs may be particularly useful.[94]

These principles, and the evidence available for payment models, provide cross-cutting lessons that guide the following recommendations for the future of primary care payment.

Implement and Research Payment Models Based in PMPMs for Primary Care

Despite the shift from volume to value, FFS remains the dominant model[95] As the United States transitions away from FFS, more primary care payment models based in prospective payment should be implemented. The most promising evidence across the Quadruple Aim came from comprehensive primary care payment and DPC. Both models use prospective fees that allow practices to tailor services to the needs of their communities and proactively implement a primary care infrastructure supporting the 4 Cs. However, evidence for both models is generally lacking, so ongoing research is critical. Recently, the Physician-Focused Payment Model Technical Advisory Committee recommended testing the American Academy of Family Physicians' proposed Advanced Primary Care APM. This primary care payment model includes a risk-adjusted PMPM along with P4P (essentially, comprehensive primary care payment) that could impact 30 million Medicare patients.[96]

Risk-Adjusted Payments to Ensure Access for All Populations to Primary Care

Risk-adjusted payments can protect against cherry-picking healthier patients that negatively impacts access and also decreases financial risk to providers, which could improve satisfaction. It is difficult to assess the impact of risk-adjustment alone however, as it is a single component of a more complex model, and significant heterogeneity exists in how payments are risk-adjusted. Nonetheless, several risk-adjusted payment models in our review found decreased health care costs/use for high-needs, high-using populations.[97,98,99,80,100] More research is needed to validate risk-adjustment tools.[101]

Broaden Investments in Primary Care to Include Behavioral Health and Social Services

One safety-net ACO in our review supporting comprehensive care inclusive of social and behavioral needs demonstrated significant promise. CMS's Accountable Health Communities demonstration project provides another opportunity to research the effect of varying levels of medical-social services partnerships on costs and use.[102] This initiative aims to connect medical and social services by creating a community-based system that identifies social barriers to health in the clinical setting and enables referrals to appropriate community services.[103] More research of similar models is needed to understand how data, costs, and risks can be shared across a truly integrated medical-social neighborhood.

Connect Payments to Performance on Patient-Centered and Primary Care-Centered Metrics

P4P studies in our review demonstrated inconsistent and mixed results on the Quadruple Aim and the 4 Cs. The overwhelming majority of quality metrics are disease-oriented measures, and the remaining measures largely focused on process measures and adherence to evidence-based guidelines[104], rather than health outcomes.[105] We recommend, as Dr. Starfield did in response to the QOF, connecting payments to metrics that capture how well a practice delivers the 4 Cs and improve patient-centered outcomes, to better account for multimorbidity and the contexts of patients' lives.[106]

Both the complexity of primary care and the administrative burden of measurement stand as barriers to adequately evaluating the 4 Cs.[107] Already, the health care system pays $15.4 billion annually to measure quality metrics.[108] Early brightspots exist in evaluating some of the attributes of primary care, such as continuity[109], comprehensiveness[110], and contact[111], as well as patient-centered outcomes[19], but much more work remains in developing those measures and confirm-

ing their validity across various populations.[112] We support the recommendations of others for more research to create metrics that effectively measure primary care[113], health information technology to capture those metrics[114], and a national organization that validates, disseminates, and implements these measures.[115]

Rapid Dissemination and Research is Necessary in Emerging Primary Care Payment Models

Our review revealed several remaining areas for research in primary care payment. Evidence is particularly limited regarding provider satisfaction and comprehensiveness, and the emerging primary care payment models (eg, comprehensive primary care, DPC) lack independent evaluation of their impact on the Quadruple Aim. Furthermore, the majority of models in our review demonstrated mixed results, pointing to the need for ongoing research in variation of Quadruple Aim outcomes within each model that could elucidate which factors (eg, clinical characteristics/settings, payer characteristics, variations in payment amounts) most impact outcomes, and accounting for how payment impacts delivery of care.

Limitations

As a narrative review, our search may not have captured all the relevant evidence. Similarly, a quality assessment was not conducted, although articles with higher levels of evidence (eg, systematic reviews) were prioritized. Furthermore, our recommendations were guided by seminal examples of these models of the main payment models represented in US health care, rather than strictly through randomized control trials, which do not exist for the majority of the models reviewed. Given this, as well as significant heterogeneity in study design, populations, delivery settings, and metrics evaluated, standard quantitative summary methods were not possible. Finally, although our review focused on payment models, significant heterogeneity in the delivery and services stemming from the payment structure is a possible confounder to interpreting our results; however, changes in payment enable changes in delivery, and in many instances, it may be difficult to separate their effects.

Conclusion

Evidence from Starfield and others[2–15] supports the central role of primary care in high-performing health systems and the achievement of population health goals. Effective payment for primary care delivery, supportive of the 4 Cs, can lead to achieving the Quadruple Aim. Findings from this review can help guide future implementation and research efforts to successfully shift away from a FFS model that has inhibited primary care. MACRA, through its support of APMs, as well as a host of multipayer initiatives such as the CMMI's Comprehensive Primary Care Plus demonstration project and the American Academy of Family Physicians's Advanced Primary Care APM, signal an opportunity for the US health care system to continue the transition from volume-based to value-based care. Increasing investments into primary care is necessary but not sufficient for improving health care; how we invest in a comprehensive primary care infrastructure—spanning health care delivery, research, practice transformation support, and HIT—to evolve how care is both delivered and measured will be critical.

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References

1. World Health Organization. Declaration of Alma-Ata. International Conference on Primary Health Care, Alma-Ata, USSR, 6–12. September 1978. Available from: URL: http://www.who.int/publications/almaata_declaration_en.pdf.
2. Starfield B, Shi L. Policy relevant determinants of health: an international perspective. Health Policy 2002;60:202–21.
3. Shi L, Macinko J, Starfield B, Politzer R, Xu J. Primary care, race, and mortality in U.S. states. Social science & medicine 2005;61:65–75.
4. Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. Milbank Q 2005;83:457–502.
5. Kringos DS, Boerma WG, Hutchinson A, van der Zee J, Groenewegen PP. The breadth of primary care: a systematic literature review of its core dimensions. BMC Health Serv Res 2010;10:65.
6. Friedberg MW, Hussey PS, Schneider EC. Primary care: a critical review of the evidence on qual-

ity and costs of health care. Health Aff 2010;29:766–72.
7. Shi L. The impact of primary care: a focused review. Scientifica 2012.
8. Bazemore A, Petterson S, Peterson LE, Phillips RL. More comprehensive care among family physicians is associated with lower costs and fewer hospitalizations. Ann Fam Med 2015;13:206–13.
9. Organization for Economic Co-operation and Development (2014). OECD health data 2014: how does the United States compare? The Organization for Economic Co-operation and Development. Paris, France. Available from: http://www.oecd.org/unitedstates/BriefingNoteUSA2014.pdf. Published 2014. Accessed March 4, 2016. Available from: http://www.oecd.org/unitedstates/Briefing-Note-UNITED-STATES-2014.pdf.
10. Berwick DM, Hackbarth AD. Eliminating waste in U.S. health care. JAMA 2012;307:1513–6.
11. Mossialos E, Wenzl M, Osborn R, Anderson C. International profiles of health care systems, 2014. New York (NY): The Commonwealth Fund; 2015.
12. National Research Council, Institute of Medicine. US Health in international perspective: shorter lives, poorer health. Washington, DC: National Academies Press; 2013.
13. The Institute of Medicine. U.S. health in international perspective: shorter lives, poorer health. Washington, DC: The National Academies Press; 2013.
14. Bodenheimer T, Sinsky C. From triple to quadruple aim: care of the patient requires care of the provider. Ann Fam Med 2014;12:573–6.
15. Woolf SH, Aron LY. The US health disadvantage relative to other high-income countries: findings from a National Research Council/Institute of Medicine report. JAMA 2013;309:771–2.
16. Phillips RL Jr., Bazemore AW. Primary care and why it matters for US health system reform. Health Aff (Millwood) 2010;29:806–10.
17. Goroll AH, Berenson RA, Schoenbaum SC, Gardner LB. Fundamental reform of payment for adult primary care: comprehensive payment for comprehensive care. J Gen Intern Med 2007;22:410–5.
18. World Health Organization (WHO). Health system financing. Geneva: WHO; 2010. P. 72–5.
19. Rollow W, Cucchiara P. Achieving value in primary care: the primary care value model. Ann Fam Med 2016;14:159–65.
20. Patient Protection and Affordable Care Act, 42 U.S.C. § 18001; 2010.
21. Davis K, Abrams M, Stremikis K. How the Affordable Care Act will strengthen the nation's primary care foundation. J Gen Intern Med 2011;26:1201.
22. Center for Medicare & Medicaid Services. About the CMS Innovation Center. Available from: https://innovation.cms.gov/About/index.html. Published 2015. Accessed March 30, 2016.
23. Centers for Medicare & Medicaid Services (CMS). Medicare Program; Merit-Based Incentive Payment System (MIPS) and Alternative Payment Model (APM) incentive under the physician fee schedule, and criteria for physician-focused payment models. Final rule with comment period. Federal register 81.214 (2016): 77008. Available from: https://www.federalregister.gov/documents/2016/11/04/2016–25240/medicare-program-merit-based-incentive-payment-system-mips-and-alternative-payment-model-apm. Accessed January 06, 2018.
24. Stange KC, Nutting PA, Miller WL, et al. Defining and measuring the patient-centered medical home. J Gen Intern Med 2010;25:601–12.
25. Doohan N, Coutinho AJ, Lochner J, Wohler D, DeVoe J. "A Paradox Persists When the Paradigm Is Wrong": Pisacano scholars' reflections from the inaugural Starfield Summit. J Am Board Fam Med 2016;29:793–804.
26. Grant MJ, Booth A. A typology of reviews: an analysis of 14 review types and associated methodologies. Health Info Libr J 2009;26:91–108.
27. Goodson JD. Unintended consequences of resource-based relative value scale reimbursement. JAMA 2007;298:2308–10.
28. Sinksy CA, Dugdale DC. Medicare payment for cognitive vs procedural care: minding the gap. JAMA Intern Med 2013;173:1733–7.
29. Miller HD. From volume to value: better ways to pay for health care. Health Aff 2009;28:1418–28.
30. Draper DA, Hurley RE, Lesser CS, Strunk BC. The changing face of managed care. Health Aff 2002;21:11–23.
31. Rice N, Smith PC. Capitation and risk adjustment in health care financing: an international progress report. Milbank Q 2001;79:81–113.
32. Pope GC, Kautter J, Ellis RP, et al. Risk adjustment of Medicare capitation payments using the CMS-HCC model. Health Care Financ Rev 2004;25:119.
33. Miller RH, Luft HS. HMO plan performance update: an analysis of the literature, 1997–2001. Health Aff 2002;21:63–86.
34. Llanos K, Rothstein J. Physician pay-for-performance in Medicaid: a guide for states. Center for Health Care Strategies, Incorporated; 2007.
35. Miller RH, Luft H S. HMO plan performance update: an analysis of the literature, 1997–2001. Health Aff 2002;21:63–86.
36. Miller RH, Luft HS. Does managed care lead to better or worse quality of care? Health Aff 1997;16:7–25.
37. Berwick DM. Payment by capitation and the quality of care. N Engl J Med 1996;335:1227–31.
38. Miller RH, Luft HS. HMO plan performance update: an analysis of the literature, 1997–2001. Health Aff 2002;21:63–86.
39. Llanos K, Rothstein J. Physician pay-for-performance in Medicaid: a guide for states. Center for Health Care Strategies, Incorporated 2007.

40. Gillam SJ, Siriwardena AN, Steel N. Pay-for-performance in the United Kingdom: impact of the quality and outcomes framework—a systematic review. Ann Fam Med 2012;10:461–8.
41. Roland M, Campbell S. Successes and failures of pay for performance in the United Kingdom. N Engl J Med 2014;370:1944–9.
42. Doran T, Kontopantelis E, Valderas JM, et al. Effect of financial incentives on incentivized and non-incentivised clinical activities: longitudinal analysis of data from the UK Quality and Outcomes Framework. BMJ 2011;342:d3590.
43. Starfield B, Mangin D. An international perspective on the basis of pay-for-performance. The Quality and Outcomes Framework: QOF-Transforming General Practice 2016;147.
44. Bazemore A, Petterson S, Peterson LE, Phillips RL. More comprehensive care among family physicians is associated with lower costs and fewer hospitalizations. Ann Fam Med, 2015;13:206–13.
45. Rosenthal MB, Frank RG, Li Z, Epstein AM. Early experience with pay-for-performance: from concept to practice. JAMA 2005;294:1788–93.
46. Lemak CH, Nahra TA, Cohen GR, et al. Michigan's fee-for-value physician incentive program reduces spending and improves quality in primary care. Health Aff 2015;34:645–52.
47. Scott A, Sivey P, Ait Ouakrim D, et al. (2011). The effect of financial incentives on the quality of health care provided by primary care physicians. Cochrane Database Syst Rev 2011:9.
48. Eccles MP, Shepperd S, Scott A, Flodgren G, Parmelli E, Beyer FR. An overview of reviews evaluating the effects of financial incentives in changing healthcare professional behaviours and patient outcomes. The Cochrane Library; 2010.
49. Nelson, L. Lessons from Medicare's demonstration projects on value-based payment. Congressional Budget Office, Working Paper, 2012;2.
50. Marshall L, Charlesworth A, & Hurst J. The NHS payment system: evolving policy and emerging evidence. London: The Nuffield Trust; 2014.
51. Scott A, Sivey P, Ait Ouakrim D, et al. The effect of financial incentives on the quality of health care provided by primary care physicians. Cochrane Database Syst Rev 2011;9(9).
52. Mittelstaedt TS, Mori M, Lambert WE, Saultz JW. Provider practice characteristics that promote interpersonal continuity. J Am Board Fam Med 2013; 26:356–65.
53. Roland M, & Guthrie B. Quality and outcomes framework: what have we learnt? BMJ 2016;354:i4060.
54. de Bakker DH, Struijs JN, Baan CA, et al. Early results from adoption of bundled payment for diabetes care in the Netherlands show improvement in care coordination. Health Aff 2012;31:426–33.
55. de Bakker DH, Struijs JN, Baan CB, et al. Early results from adoption of bundled payment for diabetes care in the Netherlands show improvement in care coordination. Health Aff (Millwood) 2012;31: 426–33.
56. Bertko, J, Effros, R. Analysis of Bundled Payment. RAND Health COMPARE. Available from: http://www.rand.org/pubs/technical_reports/TR562z20/analysis-of-bundled-payment.html. Published 2010. Accessed March 9, 2016.
57. Hussey PS, Ridgely MS, Rosenthal MB. The PROMETHEUS bundled payment experiment: slow start shows problems in implementing new payment models. Health Aff 2011;30:2116–24.
58. Wesselink SFO, Lingsma HF, Ketelaars CAJ, Mackenbach JP, Robben PBM. Effects of government supervision on quality of integrated diabetes care: a cluster randomized controlled trial. Med Care 2015;53:784–91.
59. Wojtak A, Purbhoo D. Perspectives on advancing bundled payment in Ontario's home care system and beyond. Healthcare Q 2015;18:18–25.
60. Hayen AP, van den Berg MJ, Meijboom BR, Struijs JN, Westert GP. Incorporating shared savings programs into primary care: from theory to practice. BMC Health Serv Res 2015;15:580.
61. Hayen AP, van den Berg MJ, Meijboom BR, Struijs JN, Westert GP. Incorporating shared savings programs into primary care: from theory to practice. BMC Health Serv Res 2015;15:580.
61. Barnes AJ, Unruh L, Chukmaitov A, van Ginneken E. Accountable care organizations in the USA: types, developments and challenges. Health Policy 2014;118:1–7.
63. Sandberg SF, Erikson C, Owen R, et al. Hennepin Health: a safety-net accountable care organization for the expanded Medicaid population. Health Aff 2014;33:1975–84.
64. Goroll AH, Schoenbaum SC (2012). Payment reform for primary care within the accountable care organization: a critical issue for health system reform. JAMA 2012;308:577–8.
65. Muhlestein DB, Croshaw AA, Merrill T P (2013). Risk bearing and use of fee-for-service billing among accountable care organizations. Am J Manag Care 2013;19:589–92.
66. Jha, A. ACO winners and losers: a quick take. The Health Care Blog. Available from: http://thehealthcareblog.com/blog/2016/08/30/aco-winners-and-losers-a-quick-take/. Published August 30, 2016. Accessed December 3, 2016.
67. Medicare ACOs: incremental progress, but performance varies. Available from: http://healthaffairs.org/blog/2016/09/21/medicare-acos-incremental-progress-but-performance-varies/. Published September 21, 2016. Accessed December 03, 2016.
68. Medicare ACOs: incremental progress, but performance varies. Available from: http://healthaffairs.org/blog/2016/09/21/medicare-acos-incremental-

progress-but-performance-varies/. Published September 21, 2016. Accessed December 03, 2016.
69. Goroll AH, Schoenbaum SC. Payment reform for primary care within the accountable care organization: a critical issue for health system reform. JAMA 2012; 308:577–8.
70. RTI International. Evaluation of the multi-payer advanced primary care practice (MAPCP) demonstration, third annual report. Available from: https://downloads.cms.gov/files/cmmi/mapcp-thirdevalrpt.pdf. Published 2016. Accessed January 30, 2017.
71. Merrell K, Berenson RA. Structuring payment for medical homes. Health Aff 2010;29:852–8.
72. Peikes D, Swankoski K, Mutti A,et al. Evaluation of the Comprehensive Primary Care initiative: third annual report. Available from: https://innovation.cms.gov/Files/reports/cpci-evalrpt3.pdf. Published 2016. Accessed January 30, 2017.
73. Werner RM, Duggan M, Duey K, Zhu J, Stuart EA. The patient-centered medical home: an evaluation of a single private payer demonstration in New Jersey. Med Care 2013;51:487–93.
74. Liaw W, Moore M, Iko C, Bazemore A. Lessons for primary care from the first ten years of Medicare coordinated care demonstration projects. J Am Board Fam Med 2015;28:556–64.
75. Lemak CH, Nahra TA, Cohen GR, et al. Michigan's fee-for-value physician incentive program reduces spending and improves quality in primary care. Health Aff 2015;34:645–52.
76. Jabbarpour Y, DeMarchis E, Bazemore A, Grundy P. The impact of primary care practice transformation on cost, quality, and utilization: a systemic review of research published in 2016. Patient-Centered Primary Care Collaborative July, Washington, DC; 2017.
77. Nielsen M, Buelt L, Patel K, Nichols LM. The Patient-Centered Medical Home's impact on cost and quality: annual review of the evidence 2014–2015. Patient-Centered Primary Care Collaborative, Washington DC; 2016.
78. Liaw W, Moore M, Iko C, Bazemore A. Lessons for primary care from the first ten years of Medicare coordinated care demonstration projects. J Am Board Fam Med 2015;28:556–64.
79. Fillmore H, DuBard CA, Ritter GA, Jackson CT. Health care savings with the patient-centered medical home: community care of North Carolina's experience. Popul Health Manag 2014;17:141–8.
80. Koshy RA, Conrad DA, Grembowski D. Lessons from Washington state's medical home payment pilot: what it will take to change American health care. Popul Health Manag 2015;18:237–45.
81. Phillips RL, Han M, Petterson SM, Makaroff LA, Liaw WR. Cost, utilization, and quality of care: an evaluation of Illinois' Medicaid primary care case management program. Ann Fam Med, 2014;12:408–17.
82. Liaw W, Moore M, Iko C, Bazemore A. Lessons for primary care from the first ten years of Medicare coordinated care demonstration projects. J Am Board Fam Med 2015;28:556–64.
83. Goroll A, Bagley B, Harbrecht M, Kirschner N, Kenkeremath N. Payment reform to support high-performing practice. Report of the Payment Reform Task Force of the Patient-Centered Primary Care Collaborative. Washington, DC: Patient-Centered Primary Care Collaborative; 2010.
84. Goroll AH. Payment reform to support lasting practice reform in primary care. J Ambul Care Manage 2011;34:33–7.
85. Fernandopulle R. Learning to fly: building de novo medical home practices to improve experience, outcomes, and affordability. J Ambul Care Manage 2013;36:121–5.
86. Fernandopulle, R. Breaking the fee-for-service addiction: let's move to a comprehensive primary care payment model. Health Affairs Blog. Available from: http://healthaffairs.org/blog/2015/08/17/breaking-the-fee-for-service-addiction-lets-move-to-a-comprehensive-primary-care-payment-model/. Published August 17, 2015. Accessed March 10, 2016.
87. Phillips RL, Bazemore AW. Primary care and why it matters for US health system reform. Health Aff 2010;29:806–10.
88. Fernandopulle, R. To cure physician burnout, unburden doctors. AthenaInsight. Available from: https://www.athenahealth.com/insight/to-cure-physician-burnout-unburden-doctors/. Published 2016. Accessed February 13, 2018.
89. Wu WN, Bliss G, Bliss EB, Green LA. A direct primary care medical home: the Qliance experience. Health Aff 2010;29:959–62.
90. McCorry D. Direct primary care: an innovative alternative to conventional health insurance. Backgrounder 2014;2939:1–13.
91. Wu WN, Bliss G, Bliss EB, Green L. A. A direct primary care medical home: the Qliance experience. Health Aff 2010;29:959–62.
92. Page L. The rise and further rise of concierge medicine. BMJ 2013;347:f6465.
93. Qliance. Direct primary care model delivers 20 percent lower overall healthcare costs, increases patient satisfaction and delivers better care. PRNewswire. Available from: http://www.prnewswire.com/news-releases/new-primary-care-model-delivers-20-percent-lower-overall-healthcare-costs-increases-patient-satisfaction-and-delivers-better-care-300021116.html. Published January 15, 2015. Accessed March 11, 2015.
94. Edwards ST, Abrams MK, Baron RJ, et al. Structuring payment to medical homes after the Affordable Care Act. J Gen Intern Med 2014;29:1410–3.
95. Zuvekas SH, Cohen J. W. Fee-for-service, while much maligned, remains the dominant payment method for physician visits. Health Aff 2016;35:411–4.

96. The American Academy of Family Physicians. Advanced primary care: a foundational alternative payment model (APC-APM) for delivering patient-centered, longitudinal, and coordinated care. Available from: https://www.aafp.org/dam/AAFP/documents/advocacy/payment/apms/PR-PTAC-APC-APM-41417.pdf. Published April 14, 2017. Accessed January 22, 2018.
97. Sandberg SF, Erikson C, Owen R, et al. Hennepin Health: a safety-net accountable care organization for the expanded Medicaid population. Health Aff 2014;33:1975–84.
98. Liaw W, Moore M, Iko C, Bazemore A. Lessons for primary care from the first ten years of Medicare coordinated care demonstration projects. J Am Board Fam Med 2015;28:556–64.
99. Fillmore H, DuBard CA, Ritter GA, Jackson CT. Health care savings with the patient-centered medical home: community care of North Carolina's experience. Popul Health Manage 2014;17:141–8.
100. Phillips RL, Han M, Petterson SM, et al. Cost, utilization, and quality of care: an evaluation of Illinois' Medicaid primary care case management program. Ann Fam Med 2014;12:408–17.
101. Thomas JW, Grazier KL, Ward K. (2004). Economic Profiling of Primary Care Physicians: Consistency among Risk-Adjusted Measures. Health Serv Res 2004;39:985–1004.
102. Center for Medicare & Medicaid Services. Accountable health communities model. Available from: https://innovation.cms.gov/initiatives/ahcm/. Published February 17, 2017.
103. Alley DE, Asomugha CN, Conway PH, Sanghavi DM. Accountable health communities—addressing social needs through Medicare and Medicaid. N Engl J Med, 2016;374:8–11.
104. Porter ME, Larsson S, Lee TH. Standardizing patient outcomes measurement. N Engl J Med 2016; 374:504–6.
105. Casalino LP, Gans D, Weber R, et al. US physician practices spend more than $15.4 billion annually to report quality measures. Health Aff 2016;35:401–6.
106. Starfield B, Mangin D. An international perspective on the basis of pay-for-performance. The Quality and Outcomes Framework: QOF-Transforming General Practice, 2016;147.
107. O'Malley AS, Rich EC, Maccarone A, DesRoches CM, Reid RJ. Disentangling the linkage of primary care features to patient outcomes: a review of current literature, data sources, and measurement needs. J Gen Intern Med 2015;30:576–85.
108. Casalino LP, Gans D, Weber R, et al. US physician practices spend more than $15.4 billion annually to report quality measures. Health Aff 2016;35:401–6.
109. Saultz JW. Defining and measuring interpersonal continuity of care. Ann Fam Med 2003;1:134–43.
110. Bazemore A, Petterson S, Peterson LE, Phillips RL. More comprehensive care among family physicians is associated with lower costs and fewer hospitalizations. Ann Fam Med 2015;13:206–13.
111. Lowe RA, Localio AR, Schwarz DF, et al. Association between primary care practice characteristics and emergency department use in a Medicaid managed care organization. Med Care 2005;43, 792–800.
112. O'Malley AS, Rich EC, Maccarone A, DesRoches CM, Reid RJ. Disentangling the linkage of primary care features to patient outcomes: a review of current literature, data sources, and measurement needs. J Gen Intern Med 2015;30:576–85.
113. Stange KC, Nutting PA, Miller WL, et al. Defining and measuring the patient-centered medical home. J Gen Intern Med 2010;25:601–12.
114. Anderson KM, Marsh CA, Flemming AC, Isenstein H, Reynolds J. Quality measurement enabled by health IT: overview, possibilities, and challenges. Rockville (MD): Agency for Healthcare Research and Quality; 2012.
115. Berenson RA, Pronovost PJ, Krumholz HM. Achieving the potential of health care performance measures. Princeton (NJ): Robert Wood Johnson Foundation; 2013.