systems biology, and data sciences to better predict cardiovascular disease onset in early adulthood. In contrast to the current focus on slowing the progression of advanced plaques after middle age, future therapeutic options should be targeted at earlier stages of the disease process, with the intent of preempting the progression of cardiovascular disease. Recent proof-of-concept studies have demonstrated the feasibility of in vivo genetic engineering with nanoparticle-delivery technology to introduce *PCSK9* mutations with salutary effects within the liver that cause sustained reductions in LDL cholesterol levels. The next 50 years of efforts to conquer cardiovascular disease will probably leverage new tools and technologies, from biologics and small-molecule drugs to preventive strategies including genome editing. This endeavor will require a multilevel, systems-based approach to preempt disease at its earliest stages and exert a long-term, cumulative benefit throughout the lifespan.

An audio interview with Dr. Gibbons is available at NEJM.org

The past half-century of progress in alleviating the burdens of cardiovascular disease gives us great optimism as we look ahead to emerging opportunities to further enhance cardiovascular health. Achieving this goal will require disciplined and continuous reinvestment in discovery science, translational research, and development leading to interventions that benefit public health. This cycle enriches our understanding of the causal factors of disease — both molecular mediators and social factors — as powerful targets of action for improving patient care and public health. There will be a persistent need for advances in the science of health delivery to develop innovative strategies that propel people to adopt healthier lifestyle habits, prompt communities to make structural investments to support healthier neighborhoods, and promote the effective adoption of evidence-based solutions in various real-world contexts. As the NAM pursues scientific advances during the next five decades, the success story won't be complete until cardiovascular disease no longer represents an important cause of morbidity or death.

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Reform of Payment for Primary Care — From Evolution to Revolution

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Reforming payment for primary care has been on policymakers' agendas for well over a decade. The impetus derives from primary care's foundational role in a high-value health system and from troubling declines in the financial viability of primary care practices. Recent surveys found that 20 to 40% of respondents from primary care practices were considering sale, permanent closure, or consolidation, with safety-net practices appearing especially vulnerable. Moreover, primary care's share of total U.S. health expenditures continues to decrease. In this context, questions about how best to pay for primary care, how much to pay, and how rapidly change needs to be implemented have reemerged as urgent considerations.

Fee for service (FFS) persists as the predominant method of paying for primary care in the

United States. This retrospective, piecemeal approach to payment leaves clinicians trapped in a volume-maximizing culture that leads to rushed visits, wasteful practices, and high rates of clinician burnout. FFS payment also stifles innovation in care delivery and undermines integration with behavioral health and community services. In 2015, the Medicare Payment Advisory Commission concluded that FFS fails to foster accessible, patient-centered, high-quality care. The Covid-19 pandemic has underscored and exacerbated these shortcomings by threatening primary care practices that are still dependent on FFS payment for face-to-face visits, as visit volume has plummeted. Temporary policies authorizing payment for telemedicine visits have staunched catastrophic losses and immediate shutdowns but haven't changed the downward financial trajectory of primary care in the United States.

The current policy consensus calls for changes in payment structures to reimburse for services on the basis of value, not volume. In primary care, this change entails shifting from traditional, retrospective FFS payment for face-to-face evaluation-and-management encounters to prospective, comprehensive payment (capitation) for all aspects of primary care delivery.[1] When prospective-payment levels are appropriately set and properly risk adjusted, practices can better field and match resources to meet patient needs. This approach gives clinicians the freedom to spend sufficient time with patients and encourages innovative care tailored to patient preferences. Having a set budget discourages unnecessary care.

Most large-scale primary care payment-reform initiatives have taken an evolutionary approach, which involves phasing in capitated payment over multiple years as the proportion of traditional, volume-based FFS payment is reduced. The capitated payment is often supplemented with shared savings (in proportion to the amount of risk that a provider is willing to assume) or small payments for achieving quality-related goals. Examples of evolutionary approaches include the Comprehensive Primary Care and Comprehensive Primary Care Plus initiatives developed by the Center for Medicare and Medicaid Innovation (CMMI). Several years after implementation, these initiatives have produced only slight improvements in quality and little change in costs.[2]

There are important barriers to more revolutionary payment reform for primary care. Besides the refusal of some payers to sufficiently invest in primary care — an essential requirement — there is an underappreciated "better the devil I know" attitude among many primary care physicians. Although exiting a "hamster wheel" practice environment sounds appealing, physicians remain concerned about the adequacy of capitated payments and the degree of practice transformation required to succeed under a capitated system.

Experience with capitation under managed care in the 1990s created a lingering distrust of payers and capitated payment systems. At that time, the capitated payment was typically little more than the reimbursement that clinicians would normally receive under FFS, paid out prospectively in per-member-per-month aliquots. There was no net investment to facilitate and sustain practice transformation, nor was there adequate risk adjustment or reward for improving quality and patient experience.

Wariness also stems from clinicians' relative inexperience with the information technology, team-based multidisciplinary approaches to care, and practice-management processes needed to achieve desired outcomes associated with comprehensive payment contracts. Practices that have been certified as patient-centered medical homes are best suited to make this transition, but many clinicians — especially at smaller and less-resourced practices — remain skittish.

Today, 88% of primary care practices report that less than a quarter of their revenue derives from prospective payment. Persistence of such FFS dominance keeps practices dependent on visit volume and vulnerable to the adverse consequences of this dominance. Moreover, under current FFS schedules, payment for primary care remains inadequate, which leaves practices financially tenuous and perpetuates income disparities among physicians, thereby influencing career choices.

Given the threats facing primary care practices, some stakeholders are collaborating on efforts to implement enhanced, fully capitated payment systems from the outset. By establishing relatively short, well-supported transition periods and relying on payment models targeting the shortcomings of prior capitated models, they seek to avoid the drawn-out timeline and mediocre results of evolutionary strategies. Capital District Physicians' Health Plan (CDPHP) of Albany, New York, was one of the first stake-

holders to implement such an approach. Working in close cooperation with participating primary care practices, the payer funded 1 year of practice transformation (during which it held practices financially harmless) before implementing risk-adjusted comprehensive payment. This initiative grew from 3 practices with 15 physicians to 193 practices, 836 clinicians, and more than 242,000 plan members. The plan has documented a substantial return on investment and increases in revenue, patient and professional satisfaction, and quality of care associated with the initiative.[3]

Similar results have been generated by Iora Health, which has established networks of primary care practices paid prospectively through contracts with employers, unions, and Medicare. Representatives from CDPHP and Iora report that their primary care practices have used creative approaches to team-based care delivery during the pandemic and have avoided financial distress because they are paid prospectively, independently of visit volume. Similar initiatives on a larger scale are under way. Hawaii's Population-based Payments for Primary Care initiative implements risk-adjusted comprehensive payment for primary care practices, for example, and Rhode Island's affordability standards program mandates that all payers invest in primary care and encourages prospective payment for practices certified as patient-centered medical homes. Early results from Hawaii show improvements in quality.[4] Rhode Island has seen reductions in hospitalizations as investment in primary care has doubled and practice transformation has become widespread.

Essential common characteristics of these payment-reform efforts are net investment in primary care, collaboration between payers and practices, and participation of all principal payers. Other Organization for Economic Cooperation and Development countries devote a larger share of their total health expenditures to primary care than the United States (10 to 20%, vs. estimates of 3 to 7%). Holding practices financially harmless for the first year of care delivered under reformed payment systems and providing investment funds allows practices to develop the teams, technology, and practice-management processes necessary to succeed under a comprehensive payment contract that emphasizes the Triple Aim outcomes of lower cost, better population health, and better patient experience. Participation of all major payers isn't sufficient without net investment. CMMI's latest large-scale prospective primary care payment initiative (Primary Care First) includes all payers but seeks to be budget neutral from the start, which raises concern about the adequacy and availability of investment funding.

Other important barriers to accelerating the shift to comprehensive payment include challenges regarding patient attribution, the robustness of risk adjustment (especially with regard to incorporating social determinants of health), and measures of accountability.[5] These important details — along with strategies for properly titrating the degree of financial risk — require attention, but they should not be rate-limiting.

An emerging version of prospective payment bypasses traditional payers entirely. Referred to as "direct primary care," this approach entails patients and their families (or an employer or union on their behalf) making affordable monthly payments directly to the practice for full coverage of all primary care services. Supported by the American Academy of Family Physicians, direct primary care has been especially popular among small practices and families with high-deductible health insurance plans. Evidence is lacking on outcomes associated with this approach, its scalability, and whether it provides sufficient investment funding.

Evolutionary approaches to payment reform have paradoxically perpetuated FFS payment; they have delayed practice transformation and exposed primary care practices to financially fatal risk. A strategy of net investment, collaboration, and principal payer participation could accelerate implementation of comprehensive payment structures. Turning away from evolutionary approaches toward accelerated payment reform offers opportunities for rescuing primary care and resurrecting its promise as the foundation of a well-functioning U.S. health care delivery system.

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Without Sanctuary

S. Michelle Ogunwole, M.D

> There is nowhere Black people can go to not be inside a carceral gaze or at risk of experiencing police brutality. . . . And we, in healthcare, have to [start] building that sanctuary for folks as their human right.
>
> — Rhea Boyd[1]

On an otherwise routine day in 2014, I walked into my hospital as a new internal medicine resident to find a patient I would never forget.

Ms. A. was the first patient with sickle cell anemia I'd treated. She was 28 like me, tall like me, Black like me. But there was one notable difference between us: she was admitted for a vaso-occlusive crisis and needed care, and I was the doctor assigned to care for her.

In the mornings when I prerounded, our conversations often drifted from pain management to ordinary things, like the misery of being trapped under the hair dryer at a Black salon, or our shared love of the chopped and screwed hip hop that originated in our home state of Texas. It struck me then that in another world, Ms. A. and I could have been friends.

But in this world, I was a doctor tasked with helping her navigate her health crisis. And in that pursuit, I fell short. Even in her hospital room, where Ms. A. came to find healing and relief, she could not escape White supremacy, police violence, or White indifference. Like many Black people in the United States, she had no sanctuary.[2]

The day I began that journey started normally. I walked into Ms. A.'s room to check on her and was surprised to find her sleepier than usual. After she dozed through my more vigorous attempts to rouse her, I checked her chart for recent opioid administration: none. I found her nurse and conveyed my concerns. As we considered possible explanations for Ms. A.'s sleepiness, the nurse offered a startling theory: perhaps Ms. A. had taken pain medication not prescribed by our team. Before I could fully weigh the implications of the suggestion, the nurse recommended calling security to check the room.

I hesitated. The recommendation felt hasty. But I was a new resident and lacked the confidence to trust my instincts and disagree. Instead, I followed the nurse's recommendation.

In medicine, many decisions are necessarily time-sensitive. But that moment taught me that "tricky" health care situations often unfold even more quickly for Black patients, as clinicians move expeditiously to "have a bad feeling," to escalate, to request backup — which often arrives in uniform.

The commotion of the security guards searching the room awakened Ms. A. I sat on her bed and relayed our concerns. Still drowsy, she replied, "I have a bottle of pain meds from home. They are all mixed together in one bottle . . . easier to carry." I nodded, recalling the Ziploc bag with Tylenol, Advil, and Zyrtec in my own purse.

A few minutes later, the security guards announced their findings: a "suspicious unmarked bottle." They needed to process its contents and would not return it to her.

Ms. A. sat up and demanded an explanation. Her anger was palpable. "Y'all don't understand what I have to go through *every day*," she yelled. "This pain is