Pharmacist prescribing within an integrated health system in Washington

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Purpose. Pharmacist prescribing as part of a collaborative drug therapy agreement (CDTA) within an integrated health system in Washington is described.

Summary. Virginia Mason Medical Center (VMMC) in Seattle, Washington, uses a team-based care model with broad-based CDTAs to provide quality patient care. The majority of patients are referred to the pharmacist after a diagnosis has been made and a clinical care plan has been started. The pharmacist manages the patient’s care within his or her scope of practice as defined by state laws and further detailed by VMMC internal protocols. The pharmacist then documents in the electronic medical record the medication plan of care and other standard elements based on provider note templates. Medication prescribing and laboratory test ordering are the responsibilities of the pharmacist, as are any dosage adjustments or interpretations of laboratory test results. For some chronic diseases, the pharmacist may continue to see the patient indefinitely, replacing physician visits (e.g., for warfarin management). In more episodic care, the pharmacist may see the patient, optimize drug therapy, and then transition the patient back to the referring provider (e.g., for hypertension management). Integrating the pharmacist into the team has helped achieve optimal medication outcomes and increased patient satisfaction scores.

Conclusion. The addition of the pharmacist into a team-based care model using a CDTA helped achieve optimal medication outcomes and increased patient satisfaction scores in an integrated health system. Integration was successful due to the collaborative support from physician leadership and ongoing physician involvement. Hands-on leadership by the pharmacy department and clinic directors and the health system’s adoption of Lean methodology fostered an environment for developing innovative care models.

Healthcare delivery in the United States has become increasingly challenging due to the demands of access, safety, quality, and cost. Dramatic increases in primary care and chronic care visits have been projected to coincide with provider workforce shortages.1 A 2001 report to the Surgeon General highlighted that patient care services delivered by pharmacists have positively affected the healthcare system by improving patient outcomes, promoting patient involvement, increasing cost efficiency, and reducing care delivery demands.2 This article describes the approach an integrated health system used to evaluate the effects of clinic pharmacists within a team-based care delivery model. The physician and pharmacy leadership team focused on numerous strategies to ensure long-term success.

Background
Virginia Mason Medical Center (VMMC) is an integrated, not-for-profit healthcare delivery system in Seattle, Washington, with approximately 450 physicians, an acute care
hospital, and a network of regional medical centers providing comprehensive care. For the past 25 years, the organization has used pharmacists to support clinic providers in the management of drug therapy. The model has evolved from a single pharmacist in an endocrinology clinic to an integrated team-based role in a variety of settings. Currently, 18 pharmacists provide direct patient care in the clinic settings of primary care, cardiology, endocrinology, transplant–nephrology, and physical medicine and rehabilitation. The majority of their time is spent in face-to-face visits with patients. In 2015, the clinic pharmacists saw approximately 33,000 patients in the clinics, and another 40,000 patient encounters were completed by telephone or portal messaging. In addition to the 18 pharmacists working in the clinics, 10 pharmacists are in a centralized medication-refill authorization center that processes over 179,000 new prescriptions annually. Each pharmacist practices under a collaborative drug therapy agreement (CDTA) that allows the pharmacist to provide care through prescribing authority.

**CDTA**

Collaborative drug therapy management is practiced widely in the United States and generally requires a pharmacist to partner with a physician in order to prescribe and manage medications. In 1979, Washington became the first state to allow pharmacists to prescribe under a CDTA. Washington law permits the pharmacist to prescribe, complete physical assessments, and order laboratory tests and other diagnostics.  

The CDTA allows the pharmacist to manage drug therapy in accordance with written guidelines or protocols approved by the physician or advanced nurse practitioner who has authorized the pharmacist to prescribe. These protocols are internal and individualized for each organization. The CDTA broadly defines the types of decisions a pharmacist is authorized to make and the diseases and drug categories involved. It can be written specifically for the management of a single disease or to encompass general practice roles, depending on the practice setting and pharmacists’ training. Methods for documenting the decisions made by the pharmacist and the feedback method used to communicate with the authorizing provider must also be defined. The internal protocols are then used to more clearly define the scope of work for the pharmacist.

All CDTAs used at VMMC are approved first by the pharmacy and therapeutics (P&T) committee and then by the hospital medical staff committee. The required prescriber and pharmacist signatures are included with the CDTA. The former’s signature process is captured electronically for ease of completion. Approved CDTAs are then filed with Washington’s pharmacy regulatory body—Pharmacy Quality Assurance Commission (PQAC)—managed under the Department of Health. Once the CDTA is filed with PQAC, each pharmacist is assigned a unique CDTA identifier. The CDTA is good for two years and can be updated to reflect changes in which pharmacists are covered, who is the designated authorizing prescriber, and the scope of delegation. If a notable change in the scope of delegation is made, an addendum must be filed with PQAC.

VMMC uses a team-based care model with broad-based CDTAs. The majority of patients are referred to the pharmacist after a diagnosis has been made and a clinical care plan has been started. The pharmacist manages the patient’s care within his or her scope of practice as defined by state laws and further detailed by VMMC internal protocols. The pharmacist then documents in the electronic medical record the medication plan of care and other standard elements based on provider note templates. Medication prescribing and laboratory test ordering are the responsibilities of the pharmacist, as are any dosage adjustments or interpretations of laboratory test results. For some chronic diseases, the pharmacist may continue to see the patient indefinitely, replacing physician visits (e.g., for warfarin management). In more episodic care, the pharmacist may see the patient, optimize drug therapy, and then transition the patient back to the referring provider (e.g., for hypertension management).

**State laws**

In May 2015, the governor of Washington signed a law that further recognized pharmacists as healthcare providers. The law requires commercial insurers to include pharmacists in provider networks and to reimburse them for services provided. This formal recognition of the value pharmacists provide will further support the use of CDTAs by pharmacists to manage drug therapy as part of a team-based care model. The effective date of this law was January 1, 2016, for health systems with delegated credentialing for pharmacists in place. In preparation for the implementation of this law, health systems, insurers, and healthcare regulators worked closely together in order to understand the pharmacist practice and the way

**KEY POINTS**

- Collaboration with medical center leadership was key to program opportunities and success.
- Physician champions at each practice site were essential to program implementation.
- Team-based care ensures the right individual for the right task and optimal patient outcomes.
- Provider status readiness creates strong recognition of the value that pharmacists provide.
these processes interface with the reimbursement systems. Regardless of whether the payment model is a fee-for-service model or part of an accountable care organization–bundled care model, the use of pharmacists to manage drug therapy will contribute to lower costs of care and improved outcomes.

One area of focus for insurers is disease-specific endpoints. The Healthcare Effectiveness Data and Information Set and other objective metrics are used to compare the overall performance of providers and provider groups with that of their peers. Many of these metrics involve achieving therapeutic endpoints for drug therapy. Pharmacists who work as a member of the care team can help achieve these performance metrics. In general, drug-specific and disease-specific endpoints (e.g., blood pressure, goal cholesterol levels, medication adherence metrics) are a result of team-based care or attributed to the referring provider.

Program history

The introduction of pharmacists in the clinic setting began over 25 years ago (Figure 1). To ensure successful integration of the pharmacist into the care team, the care provided by the pharmacist must be aligned with the pharmacist’s education and training, and pharmacy leadership must be integrated into the organization’s ambulatory care leadership. In the beginning, pharmacists were introduced in an effort to facilitate the work associated with prescription refills. This particular activity was selected as a starting point because the provider could immediately realize a workload reduction by not having to process refills that were often batched for review at the end of the day. When initially started, the refill request was processed by the pharmacist and directed on to the physician for cosignature. However, the final check was soon realized to be unnecessary, and the pharmacist began to independently authorize refills under a CDTA. The internal protocols for this agreement were detailed, as standards in monitoring and care management had to be created for each drug category. The agreement also required extensive work with providers to gain consensus on a single set of refill guidelines. An evidence-based review of monitoring requirements provided a good opportunity for pharmacists and physicians to collaborate toward a standard method. The end result of this initiative was a much improved prescription refill management process. As they no longer handled the majority of their refill requests, the physicians were able to gain an additional 20–40 minutes per day to see patients, resulting in increased productivity.

One of the initial barriers to introducing a pharmacist into the clinic setting was expense. This proved to be a notable hurdle, given that the impact of a clinical pharmacist was unknown and the labor cost was significant. One of the early strategies used to introduce the pharmacist into this setting was a shared support model. In this model, the labor resource was shared initially by the pharmacy department and the clinic department. Over time, 100% of the financial responsibility for the pharmacist expense was transferred to the clinic. A three-year transition was put in place with a 50/50 split in year 1, a 25/75 split in year 2, and 100% of the expense covered by the clinic budget in year 3. This transition period allowed clinics time to reallocate medication management activities to the pharmacist and to recognize the revenue generated by the pharmacist from patient care visits.

Figure 1. Timeline showing the expansion of clinical pharmacy services at Virginia Mason Medical Center. E&M = evaluation and management.
Since pharmacists were present in the clinics to refill prescriptions, they were readily available to answer drug information questions and provide patient-specific consultations. Shortly thereafter, pharmacists began to assume care responsibilities for patients with specific diseases in both primary and specialty care areas. Early disease management focused on anticoagulation, lipid-lowering therapy, and diabetes medication management. During the first few years of the program, a separate CDTA and protocol were written for each disease. As the scope of care provided by the pharmacist became broader and encompassed numerous diseases, one general CDTA was developed to support multiple internal protocols and guidelines. The current ambulatory care clinic CDTA is a broad-based agreement providing pharmacists the authority to manage medications for nearly all chronic diseases. Within some specialty areas, a specific CDTA can be created when the intent is to have the practice limited to a subset of pharmacists who are privileged to provide specialty services that require further training and oversight experience.

**Education and training**

At VMMC, a bachelor of pharmacy or doctor of pharmacy degree and residency training are required for all ambulatory care pharmacy providers. All providers are required to maintain a certification relevant to their area of practice, such as national board certification for anticoagulation for those managing patients on anticoagulation therapies or the broader Board of Pharmacy Specialties certification for pharmacists who work in a more general or advanced practice.

Along with formal training requirements, some health systems in Washington require pharmacists to be credentialed. Within VMMC, all pharmacists practicing in the clinic setting must be credentialed as providers through medical staff services, just like all other healthcare providers. This credentialing step is initiated once the pharmacist is hired and is completed before the individual may manage patients independently. In order to help support this work, three members of the pharmacy leadership team participate on the interdisciplinary credentialing team, which is tasked with reviewing and approving all credentialing submissions and renewals for nonphysician providers. Credentialing has been taken one step further with the implementation of a privileging system to further designate the skills needed to complete the work of an ambulatory care clinic pharmacist. Within the privileging process, a pharmacist must demonstrate proficiency as a provider within a specific scope of care, which requires didactic and practical training. Proctoring by a physician or an experienced pharmacist is required to demonstrate proficiency before the pharmacist can practice independently. This approach is used for all new hires and when changes to clinical services are made.

In addition to credentialing and privileging, the clinic pharmacy team incorporates a quality-improvement process to increase patient satisfaction, improve care delivery, and manage professional growth. All pharmacists are included in the organizational program used to solicit patient satisfaction. The program uses a census-based survey (Press Ganey Associates, Kansas City, KS) to assess the patient experience delivered by all providers in the organization. This information is shared with the pharmacists monthly, and trends in patient scores are reviewed during annual evaluations. Quarterly assessments are completed through peer review to ensure a high level of care delivery and to support ongoing improvement efforts. Every three months, a different form of review is completed. The reviews include (1) an annual human resource review, which is completed jointly by a pharmacy manager and clinic director, (2) a pharmacist peer review of medical record documentation, (3) a pharmacist peer review of direct observations of visits, and (4) a physician peer review of direct observations of visits. These reviews are requirements of employment and are discussed, along with other provider feedback and professional development opportunities, during the annual review.

A focus on professional development is an important component of the program as well. All members of the team are expected to seek professional growth opportunities on their own accord and to review them with the clinic director and pharmacy manager during the annual review. This has been a key component of ensuring active involvement by all team members.

In addition to pharmacists’ own development, fostering the growth of others is just as important. Each member of the team holds a preceptor license and is involved in student or resident training. Precepting is considered part of an individual’s professional development. Much work has been completed over the past two years to standardize the precepting of students and residents during a clinical rotation. A small committee of primary preceptors develops standard reviews, assessments, and miscellaneous learning opportunities based on each student’s or resident’s level of achievement. A calendar of learning assessments that increase in difficulty has also been developed to support the preceptor and learner, allowing the preceptor to immediately focus on the individual’s opportunities for clinical growth and eliminating the need to continually try to determine the next steps in the learning process. This rotation experience is essential in providing the students and residents with exposure to a practice model using a CDTA and promotes experience of shared decision-making early on in their academic training.

One barrier to overcome when establishing pharmacists as providers within a clinic setting is determining where in the team the pharmacists are placed in terms of expectations.
For our team, all pharmacists entering ambulatory care provider roles must also complete many of the same orientations and provider-specific training modules required of physicians. Each pharmacist receives training on the four-habits model, which teaches key patient interaction techniques such as building rapport, eliciting the patient’s perspective, demonstrating empathy, and learning how to involve patients during the design of the treatment plan. In addition, pharmacy providers are supported by patient relations and can request evaluation or assistance with a provider coach at any time if they have identified areas for improvement. Pharmacists receive training on diagnostic coding and billing as part of their provider orientation from a department-designated coding and documentation analyst, as these skills are not a standard taught throughout formal education or residency programs. Each clinic pharmacist has an annual review of documentation and billing per the assigned analyst and must meet the same criteria used to assess all other providers.

**Current program**

Pharmacists operate in a team-based care model with physicians, nurses, and other healthcare providers. For the most part, care is referral based after the physician has established a diagnosis, and the patient is directed to the pharmacist for medication management. The pharmacist assumes the roles of prescribing, assessing, and monitoring medications and health status during patient visits. The patient will either remain under the care of the pharmacist until the medications are optimized or continue with the pharmacist for long-term treatment that requires intensive monitoring (e.g., anticoagulation with warfarin) (Figure 2).

**Independent clinic visit.** Patients are scheduled with the pharmacist by several methods, including physician referral within the department, physician referral from a specialty department for pharmacist follow-up in primary care, and identification of patient-specific needs within a population health management model. Pharmacists have a clinical schedule mirroring that of all other providers. This is especially helpful when medical assistants or the call center representatives are scheduling appointments. In general, the pharmacist visits range in duration from 40 minutes for new patient consultations to 20 minutes for follow-up appointments. Approximately 12–15 patients are seen daily by pharmacists, depending on the level of support staff resources (medical assistant, customer service representative, or pharmacy technician). Upon arrival, the patient is placed in a room by a medical assistant or pharmacist, depending on the clinic staffing dynamic and available resources. Next, the pharmacist outlines the care agenda with the patient and, during the initial appointment, explains the pharmacist’s scope of practice. Point-of-care testing (e.g., hemoglobin or lipid levels) is then completed if required. Next, the pharmacist completes a history of the patient’s present illness and a review of systems and performs medication reconciliation. After the evaluation is completed, medical decision-making is executed, and each patient is given an updated care plan and medication list. The follow-up time frame is determined by internal protocols and clinical judgment. For example, a patient must meet with the pharmacist twice with his or her blood pressure at clinical goal before being “discharged” back to the referring provider. When sharing the management of chronic pain, the patient must be seen by the referring provider at least once every 9–12 months.

All care is provided using an electronic medical record. This includes progress notes, e-prescribing, and orders for laboratory tests, consultations, and billing. Initially, pharmacists documented in their own section of the electronic medical record. Many other providers would then miss the note or not know where to find the information. As a result, pharmacists currently document in the provider section of the medical record and use the same disease-specific note templates used by other providers to guide their documentation.

Each visit is billed based on the type of visit and the patient’s benefit coverage. For the Medicare population, pharmacists are not recognized as providers, so visits are billed as “incident to” the supervising physician. Commercial payers have been transitioned to evaluation and management (E&M) coded visits based on complexity of care. Before 2016, all visits were billed with the same level of complexity. Since January 2016, pharmacist billing reflects the actual level of complexity of care delivered, captured by E&M codes (Figure 3).

In addition to medication management visits, some patients receive medication injections from the pharmacist. For example, in the management of anemia, the pharmacist may administer an erythropoietin-stimulating agent. The pharmacist determines the medication dose based on point-of-care laboratory test results and then administers the medication. Visits involving drug administration are billed based on the drug and injection codes rather than visit complexity.

**Clinic visit with physician.** In addition to independent clinic visits, pharmacists participate in linked visits or shared medical appointments (SMAs) with a physician. Within VMMC, a linked visit is a visit in which the pharmacist and physician provide care together during the visit. Patients are scheduled for a linked visit with the physician when identified as high risk for adverse drug events at hospital discharge. High-risk patients are defined as those discharged on an anticoagulant or antithrombotic, on a new opioid, or with changes to heart failure medications and those who express concerns about medication management. The pharmacist spends about 20–30 minutes with the patient, reviewing medications, addressing con-
cerns, and reinforcing changes. After this, the physician concludes the visit within 10–20 minutes and completes the care plan. In our experience, pharmacist involvement has reduced the burden of medication management on the physician and nursing team by ensuring skill–task alignment. These visits also introduce the pharmacist as a member of the care team and prepare the patient for the next follow-up visit, if appropriate, to occur with the pharmacist only. Linked visits also reduce the amount of time the physician needs to spend and has helped improve physician access for other patients on their panel. For example, instead of a 30-minute visit scheduled with the physician only, the pharmacist sees the patient for 30 minutes, after which the physician sees the patient for 15 minutes. This allows for an additional patient to be seen by the physician that day.

Another form of a linked visit is used for the management of patients with chronic opioid therapy. Specifically, the pharmacist assists in reviewing required risk assessments, co-morbid diseases, and drug–drug interventions and takes an active role in recommending and prescribing nonopioid interventions. Once
again, this reduces the physician time required with the patient at this annual visit. In addition, we have seen an increase in the comfort of all team members handling this patient population in primary care. It has become more of a team effort rather than an individual provider managing a high-risk patient population. This increase in comfort by team members was captured in an experience-based design questionnaire completed before and after implementation of this type of visit.

An SMA can be set up in two ways. The more common is one appointment with 6–10 patients meeting with a pharmacist, physician, and nursing care manager. These appointments are generally focused on pain management or diabetes. The patient receives more education throughout the hour appointment but may receive less one-on-one time with the physician. For stable patients, this is a great way to effectively use physician and pharmacist time to care for 6–10 patients in the same time frame that two to three individual visits could have been completed. In addition, pharmacists host their own SMAs for patients newly initiated on warfarin who are in need of initial education and an introduction to services. As noted with the linked visits, SMAs are a way to increase access to care team members, provide an alternative approach to providing care, and setup the pharmacist for future medication management opportunities.

**Expanding clinical services.** As VMMC uses a broad-based CDTA with seven internal protocols and guidelines for the abovementioned services, the addition of a new service is easily managed. New protocols can be implemented along with updates to the training and privileging processes. Some protocols (anticoagulation, lipid management, diabetes, and hypertension) have been in place for many years with a well-defined practice. Newer protocols are based on patient care needs driven by organizational or departmental goals. One of the biggest benefits of using pharmacists as providers is improving patients’ access to physicians. As access issues appear, we often ask the question if the pharmacist has the skills to take a more active role in a particular patient population. For example, in Washington, ready access to a behavioral health provider is a challenge in all health systems. In order to address this issue, our clinic pharmacists were trained to manage mild-to-moderate depression and anxiety. Behavioral health providers provided didactic training and proctoring to each pharmacist. This allows VMMC to utilize pharmacists for these visits and reserve primary care physicians and behavioral specialists to see the patients whose condition is more complicated. Further, pharmacists have been able to help train other team members, such as nurse care managers.

**Team integration.** A key element in the success of including pharmacists on the care team has been the relationship with the medical staff. Strong physician champions and collaborative efforts to identify program priorities and determine implementation strategies were essential. The pharmacists would not have been integrated into the care delivery process without physician leadership support from department chiefs, section heads, and medical directors. Once pharmacists were present in the clinic setting, physicians realized the tremendous value the pharmacists could add. Recognizing the pharmacist as providers was also a key contributing factor. It ensured that pharmacists were more likely to get support for the services they provide and also allowed them to be held to a higher standard, similar to that of an allied health professional. A frequent question encountered is “How should we handle the pharmacist regarding a particular expectation?” The answer, more often than not, is to handle pharmacists the same way we would any other pro-
provider, which means that they need to accept much more accountability for drug therapy outcomes compared to what is expected in other care delivery settings.

In addition to supporting pharmacy services, it is also extremely important that pharmacists share space with the rest of the team members. Being located within the clinic allows for building rapport among team members, “curbside” consulting, and pharmacist involvement in day-to-day operations.

Quality and metrics

One area in which many organizations struggle once pharmacists are embedded within a clinic setting is defining and measuring quality. Quality assessment is also a required element of the CDTA, and the plan must be defined in the documentation submitted to PQAC. The pharmacists are subject to some of the same assessments as those undergone by all other providers. This involves specific quality metrics (e.g., bleeding rates during warfarin use), patient satisfaction, and productivity measures (e.g., visits or revenue per full-time equivalent). Ongoing competency and proficiency were further assessed as noted previously in the peer-review process. The use of these metrics further recognizes pharmacists as providers and holds them similarly accountable in terms of the quality and efficiency of their practice. Pharmacists on the clinic team meet monthly to review standard work, consider updates in practice, and develop best-practice recommendations to improve the protocol or care practices.

Most quality metrics are attributed to the clinic, the care team, or specifically to the managing physician. In the latter, the pharmacist’s patient-specific contributions are represented in that provider’s performance metric. On a larger scale, pharmacists participate in the creation and management process of evidence-based templates used by all providers. Standardized documentation templates within the department of primary care are vetted through the best-practice tactical force. This multidisciplinary team has two ambulatory clinical pharmacists who review medication-related components of the templates. This work further supports the physician–pharmacist partnership in a team-based manner.

One therapeutic area where we track and attribute the outcome metrics specifically to the individual pharmacist is anticoagulation with warfarin. The medical center offers anticoagulation services at seven regional medical centers in the Puget Sound area that collectively manage over 2500 patients. This pharmacist-run service uses a CDTA, under which pharmacists provide point-of-care International Normalized Ratio (INR) testing for patients managed in the clinic and a subset of patients who live out of the area or who use home monitors and are managed over the telephone or through the online patient portal. Part of the management involves tracking a measure of the time in the therapeutic range (TTR) and the clinical outcomes of adverse thromboembolic and bleeding events. These data are tabulated, and the results are annually reported to the P&T committee and the hospital medical staff committee. Standard definitions and benchmark comparisons are based on published studies.7

The percentage of time patients are within their identified therapeutic INR range is known as the TTR. This is calculated based on the Rosendaal method, the same used in the RELY, ROCKET-AF, and Aristotle comparative trials.8-10 In 2014 and 2015, the TTR for all patients managed at VMMC was 70.89%. In comparison, the TTR in physician-reported studies was 51%, and those reported in randomized controlled trials were 60–65%. Major hemorrhage measured as the percentage per year was reported at 0.24% at VMMC compared with 0.1–0.74% in the same published studies.8-10

These results are suggestive of a well-controlled population, and the adverse thromboembolic and bleeding rates were similar to published best practices. There were two additional noteworthy findings in the most recent annual report. First, for the past five years, the metrics have demonstrated decreased bleeding rates annually, suggesting the success of continuous quality review of the CDTA protocol and care processes. Second, individual pharmacist results for TTR were consistent among individual practitioners, with their percentage above or below the therapeutic range varying by only 1–2%. This supports the effectiveness of a well-defined, standardized protocol as part of the CDTA.

Discussion

VMMC has demonstrated that a collaborative effort with a team-based care model is an effective method for providing quality care. Integrating the pharmacist into the team has helped achieve optimal medication outcomes and increased patient satisfaction scores. The use of CDTAs is an effective method to provide the pharmacist the necessary latitude to prescribe and manage drug therapy. The success of this team has been dependent on many factors, but a few stand out. First, integration was successful due the collaborative support from physician leadership and ongoing physician involvement. Lean concepts, including continuous quality improvement and innovative approaches to patient care, are familiar to our staff and providers, enhancing our ability to affect change.11 Work completed by the pharmacist is important for patient care but must also result in improved productivity for all team members. Second, hands-on leadership by the pharmacy department and clinic directors has provided our team with just the right amount of support for professional development and day-to-day operations.
Conclusion
The addition of the pharmacist into a team-based care model using a CDTA helped achieve optimal medication outcomes and increased patient satisfaction scores in an integrated health system. Integration was successful due to the collaborative support from physician leadership and ongoing physician involvement. Hands-on leadership by the pharmacy department and clinic directors and the health system’s adoption of Lean methodology fostered an environment for developing innovative care models.

Disclosures
The authors have declared no potential conflicts of interest.

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