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Implementation and evaluation of comprehensive medication management in telehealth practices

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Abstract

The American College of Clinical Pharmacy (ACCP) endorses comprehensive medication management (CMM) as an essential element of team-based care and advocates CMM inclusion in value-based health care reform. Remote delivery of CMM through telehealth platforms is expanding and has the potential to become one of the most common clinical pharmacy services. Building on a previous ACCP publication, "Providing Comprehensive Medication Management in Telehealth," the 2019 ACCP Clinical Practice Affairs A Committee provides insights and guidance on developing, implementing, evaluating, and improving CMM telehealth practices in this white paper.

KEYWORDS
comprehensive medication management, evaluation, implementation, telehealth, telemedicine

1 | BACKGROUND

The American College of Clinical Pharmacy (ACCP) endorses comprehensive medication management (CMM) as an essential element of team-based care and advocates CMM inclusion in value-based health care reform.[1] CMM is defined as "a patient-centered approach to optimizing medication use and improving patient health outcomes that is delivered by a clinical pharmacist working in collaboration with the patient and other health care providers."[2] CMM consists of three core components: (a) a shared philosophy of practice, (b) a consistent patient care process, and (c) a dependable practice management system.[2]

The CMM philosophy of practice represents the professional values and beliefs that serve as the foundation for delivering CMM patient care services and is defined by five core tenets (Box 1). This philosophy of practice is aligned with the models of patient care developed through the Patient-Centered Primary Care Collaborative and the Joint Commission of Pharmacy Practitioners.[2-4]

The CMM patient care process is defined as the standard of care that ensures each patient's medications (including prescription, non-prescription, alternative, traditional, vitamins, and nutritional supplements) are individually assessed to ensure appropriateness for the patient, effectiveness for the medical condition, safety given comorbidities and concurrent medications, and ability to be taken as intended.[3] For patients to receive coordinated care, CMM should occur across the continuum of care. In the CMM patient care process, pharmacists develop an individualized care plan in collaboration with the patient and the interprofessional health care team. This care plan should be designed to allow the patient to achieve the intended goals of therapy and should include appropriate follow-up to determine

patient outcomes. Provision of patient education is another vital element of CMM to ensure patient understanding, agreement, and active participation in their care plan. Patient participation and understanding are essential to effectively optimize each patient's medication experience and health outcomes.[2] CMM can be delivered in face-to-face interactions or via telehealth platforms.

Telehealth is the use of technology to deliver health care, health information, or health education at a distance.[5,6] Telehealth is a viable alternative to standard face-to-face methods of CMM and may be beneficial to a patient residing where access to health care is minimal or when transportation or time is a barrier to accessing medical services.[6] Telehealth services can be delivered in many ways, including telephonically, video conferencing in real-time (synchronous), streaming media, and store-and-forward imaging (asynchronous).[6] As technology has evolved, telehealth services have focused on using more advanced technology to provide and optimize patient care. The ACCP *Standards of Practice for Clinical Pharmacists* detail how clinical pharmacists can use real-time encounters with remote monitoring to provide CMM to patients despite the distance that separates them.[7] This paper will provide guidance to new and existing programs on implementing CMM within telehealth platforms and evaluate the core tenets of CMM within these unique practice areas.

1.1 | Implementation framework

Implementation science provides beneficial frameworks to help initiate or improve CMM telehealth practices. Many implementation and evaluation frameworks exist.[8-12] Implementation frameworks help measure various indicators including, but not limited to, readiness, acceptability, adoption, appropriateness, feasibility, penetration, sustainability, and scalability, often measured by surveys or interviews. Few validated frameworks have been applied to CMM practices. Table 1 provides definitions and examples of how these indicators have been measured for CMM practices.[13-32] A comprehensive list of implementation frameworks together with the resources to support their use can be found at the Dissemination and Implementation Models website: https://dissemination-implementation.org/.[33]

The Active Implementation Framework (AIF) has formally been applied to CMM in primary care practices.[12] The AIF contains five components: (a) a usable innovation, (b) innovation drivers, (c) implementation stages, (d) improvement cycles, and (e) implementation teams. Figure 1 provides a conceptual overview of the AIF.[12] In the text that follows, implementation of a CMM telehealth service is outlined using the AIF segmentation into the three stages of implementation: *exploration*, *installation*, and *implementation* and *evaluation*.

2 | EXPLORATION

Before initiating a CMM telehealth service, practitioners must first evaluate feasibility and the site's readiness to accept this practice

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BOX I: Core tenets of CMM philosophy of practice

- Meeting a societal need
- Assuming responsibility for optimizing medication use
- Embracing a patient-centered approach
- Caring through an ongoing patient-pharmacist relationship
- Working as a collaborative member of the health care team

Abbreviation: CMM, comprehensive medication management.

Source: McInnis T, Webb E, Strand L, Patient-Centered Primary Care Collaborative (PCPCC). The patient-centered medical home: Integrating comprehensive medication management to optimize patient outcomes resource guide, 2nd ed. Washington, DC: PCPCC; 2012. Available from: www.pcpcc.org/sites/default/files/media/medmanagement.pdf. Accessed June 20, 2019.

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innovation to ensure a clear plan for implementing a CMM telehealth practice. Areas to consider include a definition of the usable innovation (ie, CMM telehealth), an assessment of innovation "fit," the creation of implementation teams, and the development of a financial business case.

2.1 | Usable innovation

CMM is well established as a usable innovation sharing a common philosophy of practice, establishing a high-fidelity patient care process, and ensuring a dependable practice management system. During exploration of the CMM telehealth practice, all practice members and affiliated implementation team members should be familiar with the practice innovation. This may be accomplished by disseminating the CMM patient care process document[2] and other relevant materials gathered or developed by the implementation team.

2.2 | Fit assessment

Telehealth services should be needs-driven to maximize the likelihood of program success.[34] The need can originate from patients, providers, systems, or a combination of these. Data from health record systems, surveys, and quality improvement analyses can be used to conduct an initial institution-specific needs assessment. Implementation frameworks such as the Consolidated Framework for Implementation Research can help guide the identification, collation, and system-specific approaches to facilitators and barriers. This exercise will

TABLE 1 Implementation and evaluation indicators, definitions, and examples of how to apply[13-30]

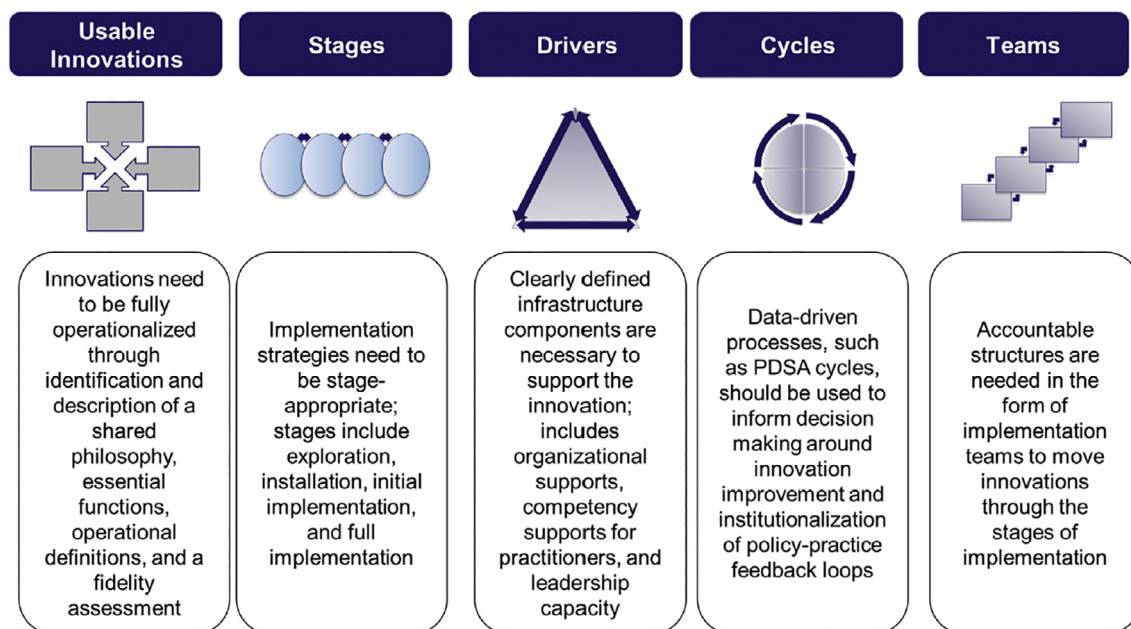| Indicator	Definition	Example methods of evaluation	Example References
Acceptability	Perception among implementation stakeholders that a given innovation is agreeable, palatable, or satisfactory	Evaluate before intervention and 3 to 6 months post-implementation	13-21
Adoption	Intention, initial decision, or action to try or use an innovation		13, 16-25
Appropriateness	Perceived fit; relevance of compatibility of the innovation for a given practice setting, provider, or consumer; and/or perceived fit of the innovation to address a particular issue or problem		13, 16-21, 23, 26
Feasibility	Extent to which an innovation can successfully be used or carried out within a given setting		13-19, 22-26
Fidelity	Degree to which an innovation was implemented as intended by the program developers	Multiple methods to evaluate the fidelity of an intervention, both to ensure initial fidelity and to ensure ongoing fidelity with minimal "drift." Encounter evaluation, reflexive ethnography, and peer evaluation and feedback on notes are examples used to assess fidelity. The CMM Patient Care Process Self-Assessment Survey can also be used to assess content fidelity. Fidelity assessment should be a continuous part of any innovation. Example frequency is biyearly	13, 16-19, 21, 22, 26, 27
Penetration	Integration of an innovation within a service setting and its subsystems	Identification of the number of individuals who receive the service from among those who were eligible for a service (target population). Data are often from population health records, registries, and electronic documentation of referrals and encounters queried on a regular basis	13, 14, 16-19, 21, 26
Sustainability	Extent to which a newly implemented treatment is maintained or institutionalized within a service setting's ongoing stable operations	Identify the performance measures the organization is striving for in the project and measure these over time. Goals should be set, which can be based on benchmarks. Make sure to build in measurements beyond the implementation phases of a project. A mixture of fiscal and quality-based strategies have previously been used to measure CMM in Minnesota	14, 21, 25, 28
Cost	Cost impact of an implementation effort	Development of a return on investment by collecting direct and indirect costs of programs and contrasting those to the costs avoided (eg, hospitalizations, outpatient visits), laboratory tests, and drug costs. Linkage with health plans using total costs of care (medical and pharmacy) provides real-cost information. Evaluation is best when compared with contemporary controls not receiving CMM, and it is best to engage a health economist for the optimal model	13, 15, 17, 19, 21, 23, 24, 26, 27, 30

Usable Innovations	Stages	Drivers	Cycles	Teams
Innovations need to be fully operationalized through identification and description of a shared philosophy, essential functions, operational definitions, and a fidelity assessment	Implementation strategies need to be stage-appropriate; stages include exploration, installation, initial implementation, and full implementation	Clearly defined infrastructure components are necessary to support the innovation; includes organizational supports, competency supports for practitioners, and leadership capacity	Data-driven processes, such as PDSA cycles, should be used to inform decision making around innovation improvement and institutionalization of policy-practice feedback loops	Accountable structures are needed in the form of implementation teams to move innovations through the stages of implementation

FIGURE 1 Active implementation framework. *Source*: Used with permission from: Blanchard C, Livet M, Ward C, et al. The Active Implementation Frameworks: A roadmap for advancing implementation of comprehensive medication management in primary care. Res Social Admin Pharm. 2017;5:922-929. PDSA, plan do study act

provide insight into the appetite and fit your system for CMM telehealth service implementation.

Proper infrastructure and logistics, in the form of a well-defined practice management system, are necessary to develop a viable CMM telehealth program. A well-defined practice management system ensures that the necessary resources and support are secured to allow the service to be delivered efficiently and effectively. The CMM practice management assessment tool (CMM PMAT) can help identify infrastructure support needs and capacity.[35,36] Implementation surveys and tools provide valuable baseline information to ensure adequate exploration during the formation of a CMM telehealth program.[12,37]

2.2.1 | Patient population

Another key element of exploring the service fit is the careful consideration and identification of the patient population most likely to benefit from a CMM telehealth service. Patients who benefit the most from CMM include those who (a) have not reached or maintained goals of therapy, (b) experience adverse effects from medications, (c) have difficulty understanding and/or following their medication regimen, (d) need preventive therapy, and/or (e) often use acute care services.[3] Others who may benefit include patients with multiple chronic diseases, those who take many medications, and those requiring frequent hospital admissions. Querying health record systems can help identify and follow the groups of patients in greatest need.

However, when determining the target population for CMM telehealth services, site-specific needs should be an essential component. Telehealth may be preferred for CMM delivery to patients in an

institutional setting when transportation or safety is a barrier (ie, nursing home, incarcerated, long-term care facilities, consultant pharmacists, or rural-dwelling individuals), patients noting the inability to attend follow-up appointments, and patients noting normal health care hours as a barrier to follow-up. In addition, telehealth allows health care providers to serve multiple sites from one centralized location. For example, a needs and feasibility assessment may find that patient volume at one physical location is insufficient to justify a full-time pharmacist. In this instance, telehealth delivery of CMM may be a solution to allow the provision of efficient patient care for multiple locations.

2.2.2 | Physical space

Appropriate physical space, settings, and equipment are key needs. Availability of patient care and non-patient care space for initial implementation and ongoing services should be identified as part of the initial exploration of a service. Private, non-patient care space includes an area for equipment and scheduling. The space for remote patient encounters should be quiet and free from background distractions.[38]

The technology modality that best meets the needs of the team as well as the patients served should be chosen, which may be multimodal. Telehealth platforms vary and include all remote at-home interactions using telephones and video conferencing as well as patients presenting to remote health care locations and using video conferencing with the pharmacist located in a central location. Video conferencing requires a remote health care facility with tested and secured methods (cameras, microphones, and lighting) to deliver

services to remote locations and appropriate staff to provide patient rooming and equipment oversight.[39]

2.3 | Implementation teams

2.3.1 | Pharmacist care providers

Clinical pharmacists providing telehealth services should receive the appropriate technological training to effectively implement and communicate plans of care to patients. The necessary telehealth credentialing and privileging should occur with the health care institution that employs the pharmacist.

2.3.2 | Support staff

Because telehealth generally involves the provider being at a separate physical location (distant site) from the patient (originating site), having a support staff member who is qualified and trained is essential to success. Ideally, the support staff member can help with medication reconciliation, collection of vital signs, and performance of point-of-care testing in addition to rooming the patient and providing other scheduling activities. Standardizing procedures and communicating early and often with support staff streamlines the growth of telehealth services and allows the provision of a high and consistent level of care.

When the patient's home is the originating site, the provider will rely heavily on the patient or caregiver to serve in this role by performing relevant point-of-care testing and helping with medication reconciliation. Patient assessment by an accurate and dependable historian may be required to allow participation in such telehealth services.

2.3.3 | Practice management staff

As telehealth pharmacy services transition from pilot projects to sustainable programs, practitioners must develop a robust practice management model that includes effective communication, operational procedures, and workflows and a sustainable revenue cycle. For health systems or health care networks with multiple telehealth programs, standardizing and aligning practice management procedures can reduce technology downtime and improve telehealth provider satisfaction.[40] Similar to direct patient care, telehealth practice management procedures should be developed and implemented by an interprofessional team that includes pharmacists, who will deliver telehealth CMM. Development of intake workflows should include support personnel such as medical assistants, pharmacy technicians, and customer service representatives. Encounter workflow development should include physicians and nurses. Revenue cycle management for pharmacy services is challenging because of the common use of "incident-to" billing and poor education on pharmacist billing outside the profession. To maximize success with revenue cycle

management, ACCP recommends a similar interprofessional approach. Pharmacists should engage coding specialists, billing personnel, compliance officers, and revenue cycle leadership to ensure appropriate code submission and processing. In addition, pharmacists should partner with those in the organization's accounting department and financial officers to develop shared revenue models or, at a minimum, ensure that the revenue generated by pharmacy services is attributed to the pharmacist delivering those services.

2.3.4 | Clinical and administrative engagement

Commitment, engagement, and buy-in from the originating site, the distant site needing clinical services, clinicians, and leadership must be established before a program can be implemented.[30] Success of implementation is further enhanced by identifying and engaging telehealth champions, leadership support, and other individuals within the organization (distant and originating sites) who are interested and willing to adopt technology in the provision of health care (ie, clinical pharmacy manager, clinic leadership, IT support, executive leadership, and patient representatives). A study evaluating the champion's role in telehealth services indicated that most services were initiated by a champion who played an essential role in sustainability and expansion.[41]

2.4 | Financial business case

As with other clinical services or programs, it is critical to develop a financial plan for delivering telehealth CMM services. This financial plan should include, at a minimum, financial justification (revenue, cost reduction/avoidance), capital investment, and an operating budget to sustain the service. More importantly, the financial plan should be adapted to the current health care finance environment and practitioners' organizational goals.

With health plans transitioning from fee-for-service to value-based care, a mixed revenue model should be deployed that includes both fee-based services and quality program revenue, whenever possible. Many fee-for-service programs are available for pharmacists to generate revenue for telehealth CMM services. The services described in the text that follows are commonly reimbursed for Medicare beneficiaries, but they may also be available for reimbursement by other third-party payers.[42-44] Organizations should confirm covered services with contracted health plans.

2.4.1 | Fee-for-service reimbursement

Although pharmacists are not recognized as providers under Medicare Part B (except for immunizations), physicians may bill for clinical pharmacist services as part of the incident-to services provided to Medicare patients. The *Medicare Benefit Policy Manual* describes the requirements for billing services provided to Medicare patients by

delegated auxiliary personnel (ie, clinical pharmacists) working in the physician's office. Clinical pharmacists meeting these requirements are permitted, within the scope of their state license, to provide incident-to billable telehealth services, which are reimbursable at the full Physician Fee Schedule value. The Centers for Medicare & Medicaid Services (CMS) outlines Healthcare Common Procedure Coding System (HCPCS)/Current Procedural Terminology (CPT) codes and respective descriptions for billable telehealth services. For example, pharmacists can provide reimbursable telehealth pharmacologic management incident-to services using HCPCS code G0459. As of January 2019, auxiliary personnel can conduct remote patient monitoring under CPT code 99457 incident to the billing practitioner's professional services. Reimbursement rates for remote physiologic monitoring have not yet been confirmed in the medical literature. However, according to the 2019 Physician Fee Schedule, billing practitioners may receive an estimated $21 per patient per calendar month for 20 minutes or more of reimbursable remote physiologic monitoring treatment management services provided by a pharmacist.[45-47]

Although not designed exclusively for telehealth services, chronic care management (CCM) can be used to reimburse certain telehealth services provided to patients enrolled in the program. CCM is a fee-based service for Medicare beneficiaries with two or more chronic diseases that reimburses practices for enhanced services provided by clinical staff, such as care coordination and medication management.[43] CCM is well suited for pharmacist-delivered telehealth CMM services for many reasons.[48] First, CCM particularly emphasizes patient interactions between face-to-face encounters, such as telephone or virtual visits. Second, CCM emphasizes comprehensive care, making it a suitable reimbursement vehicle aligned with the CMM care model. Third, CCM CPT codes allow increased reimbursement in the presence of moderate to complex medical decision-making (ie, CPT codes 99487 and 99489). Use of CPT codes is most effective for pharmacists in states where pharmacists are permitted to exercise medical decision-making independently or under collaborative practice.

Pharmacists' ability to implement CCM may be limited in some practices because significant infrastructure is needed to meet service requirements.[43] Requirements include an electronic health record, enhanced communication, continuum of care services, and 24/7 patient access to services. In addition, practices are required to obtain advanced consent and develop a comprehensive care plan for each enrollee. This model may be more feasible in practices with considerable interprofessional engagement.

Early models for reimbursing pharmacy services using CCM, including telehealth interactions, have been described. Fixen and colleagues, who specifically examined CCM reimbursement in an older population, demonstrated a reimbursement rate of $36.30 per hour of clinical contact time (using CPT code 99490 alone).[49] However, the introduction of newer CPT codes with higher reimbursement potential (ie, CPT codes 99487, 99489, and G0506) may increase this rate to as high as $65-$70 per hour of clinical time spent.[43]

Another billing option through Medicare is transitional care management (TCM). TCM services can be used to bill physician and "qualified non-physician provider" management post-discharge from an inpatient hospital stay, observation setting, or skilled nursing facility. Pharmacists are authorized to serve as the qualified non-physician providers to provide some of these services, yet the claim for these services must be submitted under a Medicare-recognized provider. Therefore, collaboration between a pharmacist and a licensed Medicare provider is necessary for reimbursement. The pharmacist must meet the incident-to requirements described in the CMS *Benefit Policy Manual*.[50]

When fee-based telehealth CMM services are delivered, ACCP recommends a collaborative revenue cycle model that includes data transparency, attribution of effort, and noncompetitive fee-based service delivery. Organizations should make revenue cycle data readily available to telehealth pharmacists to review claims rejection data and monitor the financial contribution of telehealth CMM services. In addition, revenue generated by CMM services should be shared with or allocated to the pharmacy department. Most importantly, to promote interprofessional support, pharmacists should select billing modalities that are complementary to, rather than competitive with, fee-based services provided by other health care professionals.

2.4.2 | Value-based reimbursement

Participation in value-based reimbursement programs also generates revenue and demonstrates the value of telehealth CCM services. As health care finance continues to transition from a fee-for-service model, value-based reimbursement opportunities continue to grow. As of 2019, CMS had eight value-based reimbursement programs, including the merit-based incentive payment system (MIPS). MIPS is a value-based program for Medicare beneficiaries that challenges medical practices to achieve metrics in quality of care, use of technology, performance improvement, and cost of care. In this program, medical practices' share of Medicare revenue at risk has increased annually, starting at 2% in 2017 and increasing to 9% by 2022 (ie, in 2022, practices can lose up to 9% of Medicare revenue or gain an additional 9%). After 2022, subsequent annual increases of 0.5% are expected.[51] For services delivered within health systems that include acute care hospitals, pharmacists should consider focusing on addressing value-based purchasing metrics such as reducing readmissions. In the private sector, accountable care organizations (ACOs) have developed similar value-based payment programs in both acute and ambulatory settings that pharmacists have already linked to their services.[52-56]

For organizations that participate in value-based reimbursement programs through CMS or ACOs, clinical pharmacists should align CMM telehealth services with organizational goals. Of note, quality program goals tend to attract interprofessional efforts, and the impact from any single service can be difficult to prove. As such, practitioners should develop SMART (ie, Specific, Measurable, Achievable, Relevant, Time-bound) surrogate process metrics to demonstrate and evaluate the specific impact of telehealth CMM services on value-based reimbursement program metrics.

Practitioners wishing to implement and test novel telehealth programs at their organizations may be able to obtain pilot funding from nonprofit foundations such as the Institute for Healthcare Improvement or the Agency for Healthcare Research and Quality. Several recent solicitations have indicated a general focus on ambulatory care.[56,57] In addition, practitioners at academic medical centers or organizations affiliated with academic institutions may be able to obtain intramural funding to support novel telehealth services.

2.4.3 | Cost reduction

Cost savings and cost avoidance models may help financially justify services, especially where pharmacists cannot generate revenue from fee-based services or cannot prove their impact on quality programs.[58,59] Cost savings models demonstrate a measurable reduction in operating expenses that can be tested and validated after implementation. Examples include reductions in facility or personnel costs by converting a live service to telehealth, or the typical reduction in medication costs associated with use of clinical pharmacists. Cost savings models have already been explored in the telehealth field and can easily be translated to pharmacist-delivered telehealth services.[60] Early telehealth studies of prison health care showed a lag in use of up to 4 years post-implementation but ultimately produced a cost savings of $14 per patient encounter over a 5-year period; another study established cost savings by reducing specialty referrals.[60,61] Cost savings models may vary greatly depending on the organization. For example, the Veterans Affairs (VA) health system deployed telehealth clinical pharmacy services to reduce travel costs for medical appointments—costs incurred directly by the VA system—resulting in a direct cost savings of $28 per visit.[61] Outside the VA, this cost reduction is not normally incurred by the organization and thus should not be considered in most cost-benefit analyses. Cost avoidance uses predictive modeling to estimate the potential cost savings resulting from an intervention. In telehealth, interventions often consist of identifying medication-related problems, such as drug interactions and adverse drug reactions; telemonitoring; and medication adherence programs.

2.4.4 | Capital investment and operational expenses

Implementation of telehealth services may require significant initial capital investments. Capital investments for such services may include computer hardware and peripherals, telehealth or I-software, remote kiosks, and construction or renovation of the telehealth transmitting site.[60] Communication software costs vary greatly depending on desired use, quality, and integration. Use of public face-to-face communication applications may require little or no cost, whereas dedicated telehealth software with two-way I-integration may require a large capital investment and ongoing fees per patient encounter. Large capital expenses may be offset by internal or external grants for program startup such as those listed earlier. In the absence of such

funding, capital investment, particularly in communication software, should be determined through a break-even analysis. A previously described model for a break-even analysis of telehealth services provided by non-physicians can be used to deliver telehealth CMM.[60]

For sustained telehealth services, a dedicated operational budget should be developed to include income sources, such as those described previously and operational expenses. Operational expenses for telehealth services should include salaries and benefits for the pharmacist and support staff, telecommunication (ie, telephone and Internet) services, telehealth software fees, and maintenance service agreements for hardware and software. Other costs for clinical services (eg, revenue cycle management, scheduling) can be estimated from CPT codes.

2.4.5 | Financial adaptability

The most important characteristic of effective financial planning is the plan's adaptability. Health care reimbursement, particularly in ambulatory care, has been fluid in recent years as CMS integrates more value-based models into practice. Telehealth practitioners should pursue a diverse model of revenue and cost-reduction justification to promote the stability and sustainability of services. In addition, services should purposefully be aligned with the organization's strategic and financial objectives. Services must primarily be oriented toward delivering high-quality patient care, with financial models viewed as a method of ongoing sustainability rather than profiteering.

3 | INSTALLATION

3.1 | Patient identification

Once the health care institution's needs have been assessed, the method in which patients will be recruited should be determined. Common methods include referrals or population management techniques. Referrals may help increase the sense of collaboration in the health care team, and population management may better serve the health care institution by targeting patients with the greatest need. In addition, recruitment for telehealth can cross the continuum of care to long-term care facilities, pharmacies in the community, or wherever patients access health care.

A policy should be in place to find a more suitable method of care for patients who have frequent readmissions, emergency department (ED) visits, cancellations, or appointment no-shows to help ensure adequate access to all individuals who need care. Furthermore, policies to handle emergencies or urgent visits should be developed before starting a service and communicated to the patient in case of an emergency.

3.2 | Encounter procedures

During patient encounters, it is essential to consider procedures that represent best practices. Appropriate attire should be worn to

reinforce that a telehealth visit is a professional encounter. This may be especially important if visits are taken on-call and/or from home.[62] Placing a "do not disturb" or "clinical encounter in process" sign on doors can help to ensure privacy and limited interruption during encounters.

If multiple providers participate in the synchronous encounter from individual cameras, consider leaving only one camera "open" at a time. This reduces distraction by leaving only the provider directly speaking to the patient visible. Similarly, microphones should be muted, unless speaking, to reduce background noise. Regardless of whether the encounter is synchronous or asynchronous, all providers and trainees must be authorized and should be introduced at the beginning of the encounter.[63]

In addition, prescribing controlled substances via telemedicine must be in compliance with the Ryan Haight Act.[64] This act requires an in-person medical evaluation by a licensed Drug Enforcement Administration provider at least once in the 24 months before the controlled substance prescription is initiated during virtual patient care.

3.3 | Common barriers

Potential barriers may include patient perception of lack of confidentiality or empathy from a provider or medical team. The concern for lack of confidentiality may be overcome by discussing measures of how to ensure patient confidentiality is protected at the beginning of the telehealth visit. In addition, the provider or medical team may provide empathy by looking into the camera and maintaining eye contact during the telehealth encounter.[65,66]

Certain conversations between the patient and provider may not be appropriate for telehealth delivery (eg, end-of-life discussions). The American Telemedicine Association provides guidance on situations that are not appropriate for telehealth, such as emergencies.[67] However, recommendations regarding appropriate types of discussions are lacking, and clinician ethical judgment should be used.

Because the patient is likely to be at a distant site, it is imperative to provide the patient with an after-visit clinical summary and/or ensure the patient has access to an electronic clinical summary to ensure proper understanding and adherence to the agreed-on care plan, including medication changes.

As expected, technology can be unreliable at times; thus, a backup plan is needed if connectivity issues arise (ie, bandwidth is low or Internet/telephone signal is poor). Alternatively, if user understanding and operation of technology are issues, the care team must be prepared if such complications cannot easily be worked through during the encounter. As a preventive measure, patients should be provided information on how to use telehealth technology/applications that will allow them to troubleshoot problems and resolve issues before their scheduled encounter with the clinical pharmacist.

A defined procedure is needed for escalated care in emergencies (ie, cardiac event or suicidal ideation); the pharmacist should remain in contact with the patient until the health care team or first responders arrive. All care team members should be well trained on the procedure, and patients should be educated during a telehealth orientation session.

Installation of CMM telehealth services should be needs-driven and have adequate resources to support clinical activities and practice management needs. At a minimum, this includes interprofessional engagement of clinical and nonclinical stakeholders, sustainable financial modeling, development of both policies and standard operating procedures, and a trained, engaged, and competent care team.

4 | IMPLEMENTATION AND EVALUATION

A comprehensive evaluation program is critical to the successful implementation and ongoing success of CMM telehealth services. Furthermore, dissemination of results and achievement of these metrics is vital to the sustainability of innovations. Evaluation of a CMM telehealth service should be continuous and should seek constant refinement and improvement, including assessment of practice management and operations support, fidelity of CMM to content and competence, process measures, patient satisfaction, and clinical and financial outcomes.

4.1 | Practice management and operations

Implementation evaluation provides a framework to assess context, content, and competence within the service. Evaluations should regularly be used to assess the program and monitor for drift. Practice management and operational support, defined as the necessary resources and support to provide CMM proficiently and productively, can be evaluated using the CMM PMAT.[36] This tool, intended to assess and prioritize areas for practice management improvement, includes (a) organizational support, (b) care team engagement, (c) a care delivery process, (d) CMM program evaluation, and (e) assurance of consistent and quality care. Although originally designed for use in primary care, CMM PMAT principles and elements are translatable to a telehealth practice model. The assessment tool is designed to evaluate one individual practice; however, results from multiple telehealth practices can be aggregated and analyzed for themes to address institutional support needs. Table 1 provides examples of telehealth studies describing and/or evaluating outcomes of implementation and evaluation indexes.

4.2 | Fidelity to CMM

Programs should deploy comprehensive quality management, including both quality assurance processes and continuous quality improvement. Ongoing development of clinical programs and updated training documents will ensure consistent, high-quality care. Quality management documentation should continually be evaluated, and systematic improvements should be implemented, as necessary, to ensure program sustainability as well as scalability of the intervention.

Mechanisms should be in place to ensure ongoing competency in the provision of telehealth by clinical pharmacists. A fidelity assessment for content of the services provided has been tested and validated.[26] This tool is generally used after initiating care and periodically thereafter. The fidelity assessment is a useful feedback mechanism that can help teams recognize areas that may need to be addressed and to limit drift from the core components of CMM. This tool is completed by CMM clinical pharmacists and should not be used in a punitive way because responses will be influenced if there are negative repercussions.

4.3 | Process measures

To measure and report program outcomes consistent with CMM in telehealth, baseline data should be collected and analyzed. Because access to care is one reason to initiate and maintain a CMM telehealth service, measuring and comparing patient show rates with face-to-face encounters may be a useful metric to maintain. A study using clinical video telehealth to improve access and optimize pharmacists' role in diabetes management in the veteran population showed lower no-show rates in those using telehealth (4%) than in those using face-to-face visits (10%).[14] Essential components of routine telehealth program evaluations include fiscal measures such as estimated cost savings or revenue generated; number and type of medication therapy problems (MTPs) identified and resolved; number of patients retained in a telehealth program; pharmacist productivity with respect to time spent in patient care and number and type of interventions and patients; several interventions to prevent and resolve MTPs; and patient, provider, and clinical pharmacist satisfaction.

4.4 | Patient and provider satisfaction

For a telehealth model to provide CMM successfully, patients, medical providers, and medical staff must be engaged and satisfied with the process. Ideally, a Consumer Assessment of Healthcare Providers and Systems (CAHPS) should be used to measure the patient's health care experiences as related to access to care, provider responsiveness, patient-provider communication, shared decision-making, and patient satisfaction. However, this quality measure, as outlined by CMS, is lacking for telehealth. A study of advanced practice registered nurses providing telehealth services to children evaluated family caregiver perceptions of health care. The authors concluded that telehealth services improved caregivers' experiences with health care and its providers.[68] By evaluating a CAHPS data set, another study found that telehealth visits were associated with greater patient satisfaction than standard face-to-face visits.[69]

Another scoring system, CollaboRATE, used to evaluate a patient's experience in the health care setting was developed to measure shared decision-making between patients and clinicians.[70] The post-visit survey focuses on three questions: (a) How much effort was made to help you understand your health issues? (b) How much effort

was made to listen to what matters most to you about your health issues? (c) How much effort was made to include what matters most to you in choosing what to do next? Each question is rated on a scale from 0 to 9, where 9 is associated with a response that every effort was made.[71] Although no studies have been conducted of this scoring system in a telehealth setting, it may provide insight into a patient's telehealth experience in as few as 30 seconds.

Although data are limited on the use of technology and patient engagement, a study comparing blood pressure control using a home-based blood pressure program (clinical pharmacist and health coach) with blood pressure control using usual routine care (office visits with a primary care provider) showed better blood pressure control and increased patient engagement in their disease process in the home-based program.[72]

Just as important to the patient experience is the provider and medical staff satisfaction with and level of engagement in telehealth. For instance, it is important to consider the extent of staff burnout. Telehealth programs have demonstrated benefits for providers with respect to satisfaction and burnout. After a remote pharmacist review of medication orders was implemented in three small community hospitals without 24-hour pharmacy services, surveyed nurses reported increased job satisfaction among improvements in other outcomes.[73] Similarly, after telepharmacy services were implemented in five hospitals within an integrated health system, nurses' global satisfaction with pharmacist availability for unit consultations was significantly improved. These studies also showed an increase in clinical interventions, which the authors estimated to result in cost savings.[73-75]

4.5 | Clinical and financial outcomes

Developing metrics to evaluate the clinical effectiveness of a program is recommended. Design of a CMM telehealth rollout to show clinical improvement can take many forms and use many methods, which are beyond the scope of this paper (eg, randomization, quasi-experimental studies, stepped-wedge designs). Outcomes vary widely when evaluating CMM services because heterogeneous patient populations and many clinical, humanistic, and economic goals are targeted. Despite this, meaningful overarching outcomes such as hospitalizations, readmissions to hospitals, ED visits, and ambulatory visits may align well with CMM. In addition, effects of CMM telehealth may influence provider time and burnout. For example, implementation of a telepsychiatry program for child psychiatry fellows in a pediatric ED reduced travel for face-to-face evaluations by 75% and saved on-call physicians 2.22 hours per call day. Authors of this study point out that telepsychiatry can help reduce physician burnout, which is notably high during residency training. In addition, the telepsychiatry services significantly reduced the total monthly length of ED stay for non-hospitalized patients compared with prior months and a similar seasonal time interval.[76] In another study, intensive care unit (ICU) nurses were surveyed before and after implementing tele-ICU services. Significant improvement was observed in the psychological working conditions, burnout,

relations and communication, and education subscales. Although this study was not powered to measure patient outcomes, improved outcomes from the provider side will likely improve patient outcomes in turn.[77] Overall, although telehealth appears to reduce workplace burnout, research in this area is ongoing, and these outcomes should be considered for inclusion in a CMM telehealth evaluation plan.[75-77]

The financial impact of CMM telehealth services should also be assessed. As noted earlier, there are multiple methods to generate income to support a CMM telehealth service, but assessing the impact of CMM on cost of care provides stronger justification for sustaining services. Ideally, a study comparing total cost of care with that of a well-designed control group not receiving CMM services will provide evidence of CMM impact on cost and further justification for sustaining or scaling services.

4.6 | Summary

In general, evaluation programs should be customized to the patient population and health care team and be well rounded to include clinical and nonclinical metrics. Clinical outcomes may vary but should be based on the needs and desired outcome for the service population. Nonclinical outcomes, which may be similar across practices, should include cost, acceptability, adoption, appropriateness, feasibility, sustainability, and scalability. Process measures such as tracking MTPs may also help guide process improvement, efficiency, and scalability. More importantly, outcomes should be measured and reported in a timely manner to effectively drive modifications and improvements to the CMM telehealth service.

5 | CONCLUSION

Although CMM can be implemented in various telehealth models, there are currently no standardized processes for implementing and evaluating CMM in telehealth. This white paper has integrated implementation and evaluation strategies published separately for CMM and telehealth services in addition to practice experience. The strategies included in this paper may be used as a template to guide future practice and research pertaining to CMM telehealth services.

CONFLICT OF INTEREST
The authors declare no conflicts of interest.

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