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BRIEF REPORT

Implementation of a standardized process for outpatient COVID-19 treatments at a Veterans Affairs medical center

Jeffrey D. Kravetz, Asim F. Tarabar, Robert Dalton, Brian Kotansky, Rebecca N. Curtin

Abstract

Background: The initial availability and distribution of new therapeutic options for outpatients with mild to moderate coronavirus disease 2019 (COVID-19) was limited by insufficient supply, challenges related to administration and dispensing, and unique clinical considerations of each medication.

Objective: This study aimed to describe the implementation of a standardized process for prescribing, dispensing, and administering medications for outpatients with mild to moderate COVID-19 infection.

Methods: Patients evaluated in outpatient clinics, the emergency department, or urgent care locations who tested positive for COVID-19 with mild to moderate symptoms were candidates for outpatient management. An interdisciplinary team involving physicians from primary care and the emergency department, pharmacists, and nursing developed a standardized note template to gather relevant information before initiating outpatient COVID-19 treatment. Pharmacists reviewed the patients’ eligibility for treatment and discussed the available options with providers to facilitate the timely provision of appropriate treatment.

Results: A total of 134 outpatients were evaluated for COVID-19 treatment from January 10, 2022, to March 10, 2022. Following a retrospective chart review, it was determined that a medication was administered or dispensed to 80 of those patients.

Conclusion: Collaboration as an interdisciplinary team allowed for the efficient development of a systematic process in which outpatients with COVID-19 could be evaluated, prescribed, and administered appropriate medications to reduce their risk of disease progression.

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Background

The rapid emergence and exponential spread of the Omicron variant of coronavirus disease 2019 (COVID-19) created a need for effective outpatient treatment options. Although the Delta variant was susceptible to monoclonal antibody treatment with bamlanivimab/etesevimab and casirivimab/imdevimab, these agents retained no activity against the Omicron variant. A third monoclonal antibody, sotrovimab, was in limited supply but retained activity against Omicron.1 During the beginning of the Omicron surge in late December 2021, the Food and Drug Administration issued Emergency Use Authorizations (EUs) for nirmatrelvir/ritonavir (Paxlovid) and molnupiravir (Lagevrio), 2 oral antiviral medications.2 Although the introduction of these new therapeutic agents expanded the options for treating high-risk patients with COVID-19, the limited availability prevented widespread use. Before these agents became available for use, a clinical trial published in the New England Journal of Medicine suggested that a 3-day course of intravenous remdesivir reduced the risk of hospitalization or death in nonhospitalized patients at a high risk of COVID-19 progression.3 Although remdesivir itself was readily available, a designated space with staff for providing outpatient infusions was a potential limitation. Strategies to prioritize patients and implement processes to allocate these scarce resources were required. In response, the National Institutes of Health (NIH) proposed a tiered system to evaluate and prioritize patients at the highest risk for disease progression, including those who are unvaccinated, those with severe immunocompromising conditions, and those with high-risk comorbid conditions.4 In addition to the limited

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* Correspondence: Rebecca N. Curtin, PharmD, BCPS, Associate Service Chief, Acute Care Clinical Pharmacy, VA Connecticut Healthcare System, 950 Campbell Ave., West Haven, CT 06516.
E-mail address: Rebecca.Curtin@va.gov (R.N. Curtin).
supply, each drug had specific clinical considerations that required evaluation when prescribing. Factors such as renal function, hepatic impairment, concomitant medications, and days since symptom onset were necessary to determine the most appropriate treatment for each patient.

The Veterans Affairs Connecticut Healthcare System (VACHS) consists of 8 primary care sites (2 main campuses, 6 community clinics), outpatient specialty care, an emergency department, an urgent care clinic, and a tertiary referral hospital. There are approximately 47,000 veterans cared for by 80 primary care providers across VACHS. Two drive-up COVID-19 testing sites were established at the 2 main campuses and were able to test up to 250 veterans per day, 5 days per week with additional testing available 24 by 7 in the emergency department. As an integrated health care system, COVID-19 test results were available within 24 hours for all tested veterans. Primary care providers received electronic critical alerts for all COVID-19 positive test results, and backup systems were developed to reduce the risk of a missed positive COVID-19 test result. All veterans with positive COVID-19 test results were notified within 48 hours of their test. Veterans with mild to moderate COVID-19 who were deemed to be at a high risk of progression to severe disease were identified as potential candidates for outpatient treatment and referred for management by their primary care or emergency medicine provider. In addition to established processes for COVID-19 testing, an infusion center for administration of remdesivir and sotrovimab was created. A segregated ancillary trailer, normally used for primary care appointments, was repurposed as an infusion space. The infusion center was in proximity to the emergency department and was equipped for immediate treatment of allergic reactions.

Objective

This study aimed to describe the interdisciplinary collaboration needed to implement a standardized process in which outpatients with mild to moderate COVID-19 could be efficiently evaluated and provided appropriate treatment.

Methods

The availability of medications for outpatient COVID-19 treatment presented new challenges for appropriate and timely prescribing, dispensing, and administration. To address these considerations, the VACHS quickly assembled an interdisciplinary team involving physicians from primary care and the emergency department, pharmacists, and nursing to establish a process for the use of these agents. Owing to the limited drug availability, the Scarce Resource Committee convened to create a process to properly allocate the available resources to patients at the highest risk. In addition to using the NIH prioritization criteria, the committee advocated for a centralized evaluation process to ensure consistency and equity across patients. Recognizing the need for an efficient, systematic approach, the interdisciplinary team also sought to standardize the evaluation and selection of the most appropriate therapeutic agent for each patient. The specific time frames for initiating each therapy, EUA criteria and national Veterans Affairs documentation requirements, and the unique clinical considerations of each medication created the potential for a complex prescribing process. With knowledge of daily inventory and the nuances of each medication, pharmacists were uniquely positioned to collaborate in this effort. An outline of the workflow implemented for this process is summarized in Figure 1.

For patients with a laboratory-confirmed diagnosis of COVID-19 at VACHS, a standardized note template was integrated into the electronic health record system to gather information about the patient including onset of symptoms, vaccination status, high-risk medical conditions, recent laboratory parameters, childbearing potential, and history of hypersensitivity to any of the treatment options. Patients with positive test results from an outside laboratory could be reviewed by the patient’s provider and considered for treatment eligibility; however, at the time of this evaluation, home testing was not accepted. The eligibility note also contained a question about whether the patient was being treated on site and if patients had the ability and willingness to come on site for 1- or 3-day infusions. In addition, providers were asked to document having a discussion with the patients about the scarcity of therapeutic options and the potential need to prioritize available treatments for patients at the highest risk of progression to a severe disease if demand exceeded supply. Providers were also prompted to discuss the need for patients to report adverse reactions if one of the COVID-19 treatment options was ultimately prescribed. Upon entry of the eligibility note in the electronic medical record, the notes were queued to print to a designated printer in the inpatient pharmacy. Notes were then triaged to a pool of pharmacists, one of whom was designated to review each request.

The Infectious Disease Clinical Pharmacy Specialist played a leading role in the implementation of this process at our facility. The need for more pharmacist involvement quickly became apparent with the volume of requests, and pharmacists from other areas of the department were oriented and trained to complete the evaluations. Ultimately 21 pharmacists with practice settings in acute care, home-based primary care, and ambulatory care clinics became involved to divide the COVID-19 treatment workload, while maintaining their usual clinical responsibilities. Because the number of requests varied considerably on a daily and weekly basis, having a large pool of trained pharmacists allowed flexibility to handle the fluctuations in workload.

Drug-specific resources and procedures were maintained in an electronic document on a shared drive accessible to the pharmacists. Using an electronic format allowed for updated information to be more easily incorporated and communicated. Up-to-date inventory quantities were also included in this document such that pharmacists in any location could access this information. Pharmacists involved in the assessment of patients also took part in a hands-on training using patient cases to become oriented to the available resources and checklists. An educational session was also conducted for providers to disseminate information about the new drug therapies as well as the process for providing them.

Patients were reviewed in the order in which their eligibility notes were submitted. Pharmacists reviewed the templated notes within 24 hours of entry, most often within several hours of their submission. The involvement of the inpatient pharmacists, who were available 24 by 7, allowed the eligibility requests to be reviewed 7 days a week and outside of normal business hours, if needed. Current inventory of
medications available and the drug- and patient-specific factors were considered to determine which therapeutic agent(s) would be most appropriate for the patient. NIH tiers were used to prioritize treatments if supply was insufficient to fulfill all pending requests. Once the patient had been reviewed, the pharmacist then contacted the provider to discuss the available therapeutic options. Pharmacists reviewed pertinent laboratory parameters for agents requiring potential dose adjustment to recommend appropriate dosing. In addition, a comprehensive review of medications was conducted by the pharmacist to identify any clinically relevant drug interactions with nirmatrelvir/ritonavir. Drug interaction management strategies were then discussed with the provider to determine if holding or reducing a concomitant medication or monitoring for potential adverse effects was warranted. If the drug interaction mitigation strategies were not clinically appropriate, alternative therapies would then be considered.

Following that discussion, the provider would contact the patient to review the therapeutic options and the EUA Fact Sheet, if applicable. In addition, pharmacists completed the required documentation, given the EUA status of the medications. The pharmacist assisted with the entry of the electronic medication order from a standardized order set; however, the provider who submitted the eligibility note was ultimately responsible for signing off on the medication order as the prescriber. When an intravenous COVID-19 treatment was ultimately selected for a patient, the pharmacist facilitated the scheduling of the infusion appointment(s) with the nursing department. All COVID-19 prescriptions that were requested through this process were dispensed at one of the VACHS pharmacy locations. As with any medication prescribed for a veteran patient, providers could call in prescriptions to non-VA pharmacies; however, these prescriptions were not adjudicated through this process.

Most patients’ prescriptions were mailed overnight to ensure timely delivery and initiation, while decreasing the possibility for additional COVID-19 transmission from patients presenting to the pharmacy. Delivery through a courier was also used for selected patients if treatment needed to be initiated on the same day to adhere to the time frame specified by the EUA. A family member of the patient could alternatively present to the pharmacy window to pick up the medication. Infrequently, the prescription was brought to the patients’ car at the facility if other options for delivery or pickup were not feasible.

### Results

From January 10, 2022, to March 10, 2022, 484 patients tested positive for COVID-19 at VACHS. These results included tests performed at one of the VACHS laboratory locations, excluding patients who were admitted to the hospital, those undergoing asymptomatic preprocedural screening, and individuals tested through employee health. During this time period, 134 eligibility notes for outpatient COVID-19 treatment were entered (Table 1). Data were not collected for patients who were not referred for treatment, but those patients may have been ineligible, uninterested in treatment, or obtaining care from outside the VA. A retrospective chart review was conducted to review the outcome of eligibility notes that were entered. In total, 80 patients received treatment with one of the available medication options. Of the patients who were

| Selection of therapeutic agent | Medication dispensing/preparation |
|-------------------------------|----------------------------------|
| **Provider**                  | **Pharmacist**                   |
| COVID-19 -positive laboratory  |                   |                   |
| result reported to provider   |                   |                   |
| for patient with mild-moderate|                   |                   |
| disease at high risk of        |                   |                   |
| progression                   |                   |                   |
| Provider entered COVID-19      | Pharmacist evaluated patient    | Pharmacist filled/prepared |
| outpatient treatment eligibility | determined eligibility for     | medication, completed    |
| note in the electronic medical | treatment and which agent(s)    | EUA documentation, and   |
| record                        | were available and most         | arranged for delivery of  |
|                               | appropriate                     | oral medication to patient|

Figure 1. VACHS outpatient COVID-19 treatment process. Abbreviations used: VACHS, VA Connecticut Healthcare System; COVID-19, coronavirus disease 2019; EUA, emergency use authorization.
Furthermore, pharmacists possessed knowledge of EUA requirements, such as drug interactions or renal dose adjustments. Prescribing proactively addressed medication-related problems seen with new variants, a systematic approach to the distribution of these agents and the rapid growth of COVID-19. Implementation of a centralized process for prescribing outpatient COVID-19 treatment required a comprehensive, standardized manner to ensure consistency among pharmacists in the evaluation, provision, and documentation of treatment provided to the patients. In addition, electronic resources assisted with the dissemination of updated information regarding inventory and changes in recommendations. Furthermore, changes were made to the eligibility note template in the medical record as needed to gather additional pertinent information from providers as the process evolved over time. The ability to promptly update electronic resources and templates allowed the process to remain flexible to adapt to changes or opportunities for improvement.

As the number of pharmacists involved in the process increased, it was important to maintain standardization among everyone involved. Providing a comprehensive electronic resource to the pharmacists facilitated the dissemination of information as changes occurred. It also provided a standardized framework and checklists outlining the steps in the process to ensure consistency among pharmacists in the evaluation, provision, and documentation of treatment provided to the patients. In addition, electronic resources assisted with the dissemination of updated information regarding inventory and changes in recommendations. Furthermore, changes were made to the eligibility note template in the medical record as needed to gather additional pertinent information from providers as the process evolved over time. The ability to promptly update electronic resources and templates allowed the process to remain flexible to adapt to changes or opportunities for improvement.

In addition to the pharmacist’s role in the selection of appropriate treatment options for each patient, a large proportion of patients was also deemed to be ineligible for one of the available treatment options based on the duration of symptoms or the absence or resolution of symptoms. Assuring that these medications were only being provided to patients who met specific criteria was important to maintain strict compliance with the EUA requirements and to conserve the limited resources for eligible patients.

### Conclusion

As new therapeutic options were introduced for the treatment of COVID-19, implementing a standardized process involving a designated team to assess and allocate limited resources allowed patients to receive appropriate treatment in a timely manner. Going forward, with the ongoing development of new treatment strategies, positioning pharmacists to aid in roles that extend beyond dispensing can contribute to the health care team’s ability to care for patients efficiently and effectively. Implementing a standardized approach for the evaluation of these COVID-19 EUA therapeutics ensured timely and appropriate prescribing at VACHS. This process has the potential to not only aid in delivery of treatments for COVID-19 but also for future allocation of any medication requiring prioritization schema because of resource scarcity.

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### Table 1

| Treatment               | Patients, n (%) |
|-------------------------|-----------------|
| Remdesivir             | 30 (22.4)       |
| Nirmatrelvir/ritonavir  | 24 (17.9)       |
| Molnuparivir           | 15 (11.2)       |
| Sotrovimab             | 11 (8.2)        |
| No treatment           | 54 (40.3)       |
| Total                  | 134 (100)       |

Abbreviation used: COVID-19, coronavirus disease 2019.
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**Jeffrey D. Kravetz, MD,** Chief, Primary Care, VA Connecticut Health Care System, West Haven, CT; and Associate Professor, Internal Medicine, Yale University School of Medicine, New Haven, CT

**Asim F. Tarabar, MD, MS,** Chief, Medical Emergency Department, VA Connecticut Health Care System, West Haven, CT; and Assistant Professor of Emergency Medicine, Yale University School of Medicine, New Haven, CT

**Robert Dalton, RN,** Head Nurse Manager, Medical Emergency Department, VA Connecticut Health Care System, West Haven, CT

**Brian Kotansky, PharmD, BCPS,** Clinical Pharmacy Specialist, Infectious Disease/Antimicrobial Stewardship, VA Connecticut Health Care System, West Haven, CT

**Rebecca N. Curtin, PharmD, BCPS,** Associate Service Chief, Acute Care Clinical Pharmacy, VA Connecticut Health Care System, West Haven, CT