

Project IMPACT: Test and Treat. Increasing access to Test and Treat services through community pharmacy

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Abstract:

Background: Community pharmacists are able to provide patients with access to high-quality Test and Treat services for respiratory illness utilizing innovative rapid molecular diagnostic tests, and to prescribe medication treatment when appropriate.

Methods: The primary objective of this prospective health economics and outcomes research was to evaluate the impact that pharmacists can have on patients through compensated and scalable rapid molecular Test and Treat services for COVID-19, influenza, and strep infection. Patients were surveyed to evaluate economic considerations and analyze the pharmacy-based care model.

Results: Pharmacists enrolled 253 patients, among whom there were 71 positive test results and 259 negative test results. Of the 71 patients with a positive test, 26 were prescribed medications, and 23 were dispensed medication within one day of the positive test (88%). Overall, 98% of the survey respondents indicated satisfaction with the Test and Treat service. Furthermore, although the service was free to the patients enrolled, over 80% of survey respondents indicated a willingness to pay. Survey respondents indicated a very high opinion of the test itself, with 98% indicating that the use of rapid molecular testing gave them comfort in being tested in the pharmacy.

Conclusions: Community pharmacists in this research were able to perform high-quality rapid molecular testing for respiratory illness, which led to significant interventions and high patient satisfaction. The pharmacists were able to serve patients who indicated that, if not for the pharmacy, they may otherwise have sought higher acuity care unnecessarily. When compared to similar testing service offerings through other providers and settings, the Test and Treat service demonstrated meaningful cost savings to the patient and the health care system. These results portend a strong case for establishing legislative authority for pharmacists to conduct these services throughout the U.S.

Keywords: pharmacists, test and treat, rapid molecular test, community pharmacy, respiratory illness

Introduction

Community pharmacy is well known for its high level of accessibility to the public and its ability to reach thousands of patients in the community that it serves.¹ Over the past few years, pharmacy has made great strides toward becoming a destination for “Test and Treat” services, not only for COVID-19 but for other diseases.^{2,3} Whether for COVID-19, influenza, group A streptococcus (strep), or other infection, pharmacies have proven to be extremely valuable to patients, providing access to testing services that would otherwise be much more difficult to obtain.

Research shows that the average wait time for a physician appointment in some areas may be up to 26 days.⁴ This excessive wait time may force patients to seek care elsewhere, leading to increases in urgent care visits and even hospital emergency department visits — or worse, leading patients to not seek care at all. Creating more accessible opportunities for patients to receive Test and Treat services is crucial for timely and affordable care to properly address respiratory illness. There is a clear solution: leverage broad access to community pharmacy and the important role that pharmacists can play in addressing patients’ health conditions as providers of point-of-care Test and Treat services.

Pharmacists in certain U.S. states have various degrees of practice authority to perform Test and Treat services,³ but the variance in state-to-state practice authorities, as well as in authority to test and treat across disease states, is confusing and has left both patients and the pharmacy profession alike in need of resolution. In this study, researchers sought to demonstrate that pharmacists are able to make meaningful,

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significant interventions for patients and to evaluate the related health and economic outcomes. To that end, establishing a fair market rate for pharmacist compensation of Test and Treat services is needed for a mutually beneficial pathway for patients and the healthcare system at large.

To prescribe appropriate treatment for a patient's respiratory illness, a provider first needs to be informed as to the type of pathogen involved. There are two commonly used types of diagnostic tests for respiratory illness: molecular and antigen. Molecular tests are widely considered better at detecting pathogens.⁵ Antigen tests, however, provide quick results, while molecular tests (e.g., PCR tests) have historically taken many hours or even days.⁶ The *rapid* molecular testing technology used in this study provides accurate test results in minutes, facilitating a pharmacist's ability to prescribe timely treatment specific to a patient's respiratory illness.⁷

The primary objective of this prospective health economics and outcomes research was to evaluate the impact that pharmacists can have on patients through compensated and scalable rapid molecular Test and Treat services for COVID-19, influenza, and strep infection. The hypothesis was that these pharmacist-provided services would help patients obtain treatment within one business day of testing positive, minimizing physician primary care, urgent care, and hospital emergency department use. We believed that this approach would improve the patient's health and health care experience.

This research was conducted by the American Pharmacists Association (APhA) Foundation. For over 70 years the APhA Foundation has served as a trusted source of research demonstrating how pharmacists can improve health care. The mission of the APhA Foundation is to improve health by inspiring philanthropy, research, and innovation that advances pharmacists' patient care services.

Materials and Methods

Study Design

This prospective cohort study was approved by the WCG Institutional Review Board (IRB), protocol # 20242504.

Practice Sites

This multi-site demonstration project was conducted in 15 community pharmacies in nine different states across the U.S. Each participating site was provided with training from the manufacturer on the rapid molecular testing instrument, ID NOW™ (Abbott), through both a virtual session and in-person training visits. Program support and guidance regarding the project's goals, best practices, and procedures were provided by the APhA Foundation. This approach was intended to empower pharmacists and pharmacy team members to create a patient-centered, scalable practice model within the workflow of their pharmacy.

The APhA Foundation provided community implementation support to each study site to cover costs associated with implementing the research project. The pharmacist compensation structure of this project was designed with the understanding that pharmacists deserve to be compensated at the same rate as other health care provider team members for providing the same clinical services, including rapid molecular testing. The pharmacies were compensated \$70 per patient enrolled, and the manufacturer provided each pharmacy with tests and the testing instrument for use during the research. To perform these services, participating pharmacists had to have direct test and treat authority in their state and/or the ability to form a collaborative practice agreement with a provider. Participating pharmacies had a CLIA-waived laboratory testing certificate that allowed for rapid molecular testing at their location.

Participants

The financial incentive for patients to participate in the project was free access to a pharmacist-provided assessment and test for respiratory illness.

Individuals eligible to be enrolled in the research included any patient at least 18 years of age presenting to the pharmacist with suspected respiratory infection. The exclusion criteria were individuals with cognitive impairment without a caregiver with power of attorney, those who were pregnant, those who were incarcerated, those in long-term care facilities, and those who did not meet the inclusion criteria. Patients were enrolled between July 10, 2024, and November 30, 2024.

Process of Care

Pharmacists enrolled patients using procedural guidelines (Appendix A) in conjunction with their state protocol or collaborative practice agreements for performing this service. The pharmacist performed a patient evaluation (symptom check, medical history, allergies, and other questions as needed) to determine the appropriateness of the test. If the test was not appropriate, the pharmacist referred the patient to other care and did not enroll the patient in this research.

Patients who met the qualifying enrollment criteria were seated in a private/semi-private area for the patient visit and were provided with an informed consent document to accept in order to enroll. Once consent was given, the pharmacist explained the testing procedure for COVID-19, influenza, and/or strep, and allowed the patient the opportunity to ask questions. The pharmacist then proceeded with the test or tests, as patients were able to test for more than one condition if applicable. While waiting for the test results, the patient was surveyed on his/her experience (Appendix B). If the test was negative, the pharmacist referred the patient to other care and provided other guidance as needed. If the test was positive, the pharmacist presented the patient with the

opportunity to be prescribed and dispensed medication treatment in accordance with the established protocol as allowed by either their state board of pharmacy or through collaboration with a provider. The pharmacist then provided the patient with medication counseling, and attempted to follow-up with the patient within the next 2–14 days with a questionnaire (Appendix C) on the Test and Treat service.

Data Collection

All data were handled in a manner compliant with the patient confidentiality provisions of the Health Insurance Portability and Accountability Act (HIPAA) to ensure protection of patient health information. Patient demographics, process measures, and clinical outcomes were collected for evaluation. Pharmacists from the participating pharmacy sites were surveyed to provide feedback on the research project.

Statistical Analysis

The survey dataset included patients with multiple visits, and these patients were excluded from the analysis if the subsequent visit entry was not on the same day. For patients with multiple visits on the same day, only the latest entry was retained. A descriptive summary of the demographic, clinical, and behavioral characteristics was computed. Mean and standard deviation were reported for continuous variables, while counts and proportions were computed for categorical variables.

Hypothesis testing was performed for specific questions and cross tabulation. Since most of the variables in the analytical dataset are categorical, we used the Chi-squared test and, for cells containing a value less than five, the Fisher's exact test.

Hypotheses testing and data management were conducted using R software, version 4.4.1, and Microsoft Excel was utilized to compute the descriptive statistics. For this study, we set the significance level at 0.05. Results were statistically significant if the p value was less than 0.05.

Results

Pharmacists enrolled 253 patients in this research, among whom there were 71 positive test results and 259 negative test results. Out of the 71 patients with a positive test, 26 were prescribed medications, and 23 were dispensed medication within one day of the positive test (88%).

The demographic characteristics of all patients can be seen in Table 1. The majority of the patient population was White (81%) and female (69%). In addition, most of the patient population did not have prescription insurance (60%) or medical insurance (64%). There was a roughly even participation of patients from rural (44%) and urban (56%) pharmacy zip codes.⁸

Table 1. Baseline demographic characteristics

	N = 253
AGE	
Mean (SD)	55.02 (+- 18.95)
GENDER	
Male	69 (27.28%)
Female	175 (69.17%)
Missing	9 (3.56%)
RACE/ETHNICITY	
Non-Hispanic White	206 (81.43%)
Non-Hispanic Black	17 (6.72%)
Hispanic	11 (4.35%)
Non-Hispanic Asian	2 (0.80%)
Not specified	17 (6.72%)
EMPLOYMENT STATUS	
Employed full time	69 (27.28%)
Employed part time	22 (8.70%)
Unemployed	11 (4.35%)
Not employed and not seeking a job	77 (30.44%)
Missing	74 (29.25%)
RURAL	
Yes	111 (43.88%)
No	142 (56.13%)
PRESCRIPTION INSURANCE TYPE	
Private	65 (25.70%)
Military/VA	3 (1.19%)
Medicare	35 (13.84%)
Medicaid	5 (1.98%)
No insurance	154 (60.87%)
MEDICAL INSURANCE TYPE	
Private	60 (23.72%)
Military/VA	2 (0.80%)
Medicare	33 (13.05%)
Medicaid	3 (1.19%)
No insurance	162 (64.04%)
ANY INSURANCE	
Insured	100 (39.53%)
Uninsured	153 (60.48%)

Table 2 shows the outcome of the tests performed as well as symptom severity. Moderate and High symptom severity were correlated with a positive test result ($p < 0.001$). The 32% positive test rate for COVID-19 was substantially higher than the national average rate of 5.6%, according to the Centers for Disease Control and Prevention (CDC),⁹ for that same time frame.

Table 2. Disease-specific test results and symptom severity

	Positive	Negative
Respiratory Illness		
COVID-19 (%)	64 (31.53)	139 (68.48)
Influenza (%)	2 (3.23)	60 (96.78)
Strep (%)	5 (7.70)	60 (92.31)
Symptom Severity		
Low (%)	16 (19.28)	67 (80.73)
Moderate (%)	35 (33.66)	69 (66.35)
High (%)	13 (81.25)	3 (18.75)

Table 3 shows the breakdown of medications prescribed by the pharmacist, whether medication was dispensed, and, if yes, if it was dispensed on the same day as the visit for the test. Thirty-one percent of COVID-positive patients received a prescription for medication treatment, and 90% of these patients had the prescription filled (medications dispensed), all on the same day as the visit.

Table 3. Medications prescribed and dispensed

	Positive Tests		
	COVID (n = 64)	Flu (n = 2)	Strep (n = 5)
Medications prescribed, n (%)	20 (31.25)	1 (50.00)	5 (100.00)
Medications dispensed, n (%)	18 (28.13)	1 (50.00)	4 (80.00)
Medications dispensed on the same day as visit for test, n (%)	18 of 18 (100.00)	1 of 1 (100.00)	4 of 4 (100.00)

While patients were waiting for their test results, they were surveyed on their pharmacy experience as well as on some other health and economic factors. Highlights of the survey are shown in Tables 4–9. See Appendix B for the initial patient questionnaire in its entirety.

As Table 4 shows, the majority (66%) of employed patients did not have to take time off work to receive the Test and Treat service at the pharmacy.

Table 4. Time off Work by Employment Status.

Time off work by employment	Employed full time (n=69)	Employed part time (n=22)	Unemployed (n=85)
None (%)	41 (59.43)	19 (86.37)	84 (98.83)
30 minutes (%)	8 (11.60)	1 (4.55)	1 (1.18)
1 hour (%)	5 (7.25)	0 (0)	0 (0)
Couple of hours (%)	2 (2.90)	0 (0)	0 (0)
Half a day (%)	5 (7.25)	0 (0)	0 (0)
Full day (%)	8 (11.60)	2 (9.10)	0 (0)

Among the employed patients, nearly 70% would have had to take time off work—defined as more than an hour—to visit an alternative provider. To visit the pharmacy, however, only 16% of patients indicated having to take time off work, as shown in Table 5.

Table 5. Time off work to see traditional healthcare provider

	Did you take time off work to visit the pharmacy today?	If you sought care from a traditional healthcare provider (e.g., primary care physician, urgent care, emergency room), would you have had to take time off work?	P value
No (%)	75 (84.27)	27 (30.33)	<0.001
Yes (%)	14 (15.74)	62 (69.66)	

As shown in Table 6, more than 46% of survey respondents who tested positive would have visited their primary care provider (PCP) if not for the pharmacy, and more than 75% of survey respondents who tested negative would have gone to their PCP, urgent care, or emergency department if not for the pharmacy.

Table 6. If not for the pharmacy, where would you have gone for testing?

Provider Type	Positive (n=60)	Negative (n=118)
PCP (%)	28 (46.67)	42 (35.60)
Urgent care (%)	15 (25.00)	42 (35.60)
ED (%)	6 (10.00)	4 (3.39)
Telehealth (%)	0 (0.00)	5 (4.24)
No test (%)	7 (11.67)	20 (16.95)
Other (%)	4 (6.67)	5 (4.24)

Overall, 98% of the survey respondents indicated satisfaction with the Test and Treat service in the pharmacy, and 99% were more than likely to refer the service to a friend. Although the Test and Test service was free to the patients enrolled, over 80% of survey respondents indicated willingness to pay, and 20% were willing to pay \$50 or more. Insurance status (insured or uninsured) had no statistically significant bearing on willingness to pay for this service. Finally, survey respondents indicated a very high opinion of the test itself, with 98% indicating that the use of rapid molecular testing gave them comfort in being tested in the pharmacy.

In addition to the in-person patient visit survey, pharmacists were also instructed to attempt to follow up with patients 2–14 days after their visit to inquire about their illness (or lack thereof) and status. See Appendix C for the follow up questionnaire in its entirety.

Table 7 shows the speed of recovery by test outcome. Nearly half of the respondents who tested negative returned to daily activities the same day ($p < 0.001$).

Table 7. Speed of recovery

Return to Daily Activities	Positive (n=57)	Negative (n=105)
Same day (%)	4 (7.02)	48 (45.72)
Next day after testing (%)	8 (14.04)	13 (12.39)
2–3 days after testing (%)	29 (50.88)	33 (31.43)
4 or more days after testing (%)	16 (28.08)	11 (10.48)

More than 85% of all respondents tested at the pharmacy did not seek additional care beyond the Test and Treat service at

the pharmacy. In addition, 93% of respondents who tested negative did not seek additional care beyond the pharmacy, as shown in Table 8.

Table 8. Additional care

Did you seek additional care beyond the pharmacy?	Positive (n=55)	Negative (n=100)
Yes (%)	4 (7.28)	9 (9.00)
No (%)	51 (92.73)	91 (91.00)

Additional analysis was performed for the rural vs. urban population, as shown in Table 9. When comparing across all provider types, there was a statistically significant difference in which type of provider a patient would have chosen, if not for the pharmacy, based on his or her rural/urban status ($p < 0.001$). Rural patients were more likely to seek care with a PCP, while urban patients would either use urgent care or not test at all ($p < 0.001$).

Table 9. Rural and urban population

	Rural	Urban
Alternate Provider Type		
PCP	48 (55.82)	22 (26.51)
Urgent care	26 (30.24)	31 (37.35)
Emergency Department	5 (5.82)	5 (6.03)
Virtual/ telehealth	3 (3.49)	2 (2.41)
No test or other	4 (4.66)	23 (27.72)
Time taken off work to visit pharmacy		
Less than couple of hours	72 (85.72)	73 (78.5)
Couple of hours or greater	12 (14.29)	20 (21.51)
Willingness to pay		
Would not pay	20 (22.73)	15 (16.31)
Less than \$50	47 (53.41)	57 (61.96)
More than \$50	21 (23.87)	20 (21.74)
Return to daily activities		
Same day or day after testing	39 (44.83)	34 (45.34)
2 or more days after testing	48 (55.18)	41 (54.67)

Additional analysis was performed for the medically insured vs. medically uninsured population, as shown in Table 10. When comparing across all provider types, there was a statistically significant difference of which type of provider a patient would have chosen, if not for the pharmacy, based on his or her insured status ($p=0.03$). Insured patients were more likely to seek care at an urgent care, while to those without insurance were more likely to seek care from their PCP ($p=0.03$).

Table 10. Insured and uninsured

	Insured	Uninsured
Alternate provider type		
PCP	26 (30.24)	44 (47.83)
Urgent care	36 (41.87)	21 (22.83)
Emergency Department	6 (6.98)	4 (4.35)
Virtual/ telehealth	3 (3.49)	2 (2.18)
No test or other	15 (17.45)	21 (22.83)
Distance to pharmacy		
Less than 2 miles	25 (29.42)	39 (41.49)
Less than 5 miles	25 (29.42)	19 (20.22)
Between 5–10 miles	24 (28.24)	21 (22.35)
Greater than 10 miles	11 (12.95)	15 (15.96)
Time taken off work to visit pharmacy		
Less than couple of hours	73 (85.89)	87 (94.57)
Couple of hours or greater	12 (14.12)	5 (5.44)
Willingness to pay		
Would not pay	15 (18.30)	17 (20.74)
Less than \$50	50 (74.63)	43 (66.16)
More than \$50	17 (34.70)	22 (37.29)
Employment status		
Employed full time	32 (36.79)	37 (40.22)
Employed part time	11 (12.65)	11 (11.96)
Unemployed	44 (50.58)	44 (47.83)

Discussion

Pharmacists in this research demonstrated their unique positioning in the community to serve in a crucial role for Test and Treat services. Pharmacists were able to make key

interventions for patients by quickly getting a highly accurate test result and immediately proceeding to prescribe medications, triage the patient to an increased level of care, or direct the patient to lower acuity ways to manage their illness (or lack thereof). This research exemplifies the ability of pharmacists to play an extremely important role on the health care team, serving patients in a highly accessible way and with low cost to both the patient and the health care system.

Results indicate that the primary drivers for seeking care in the pharmacy were convenience, low cost, and the ability to see a health care provider quickly. Patients view the pharmacy as a highly accessible way to obtain health care, and this research shows that the pharmacy is indeed capable of providing high-quality care in an efficient manner. Having more than 85% of patients require no additional care beyond the pharmacy speaks volumes as to the quality of triaging pharmacies can do. This triaging conserves the health care system's resources and quickly provides patients with the help they need.

The hypothesis of this research—that pharmacist-provided rapid molecular Test and Treat services would help patients obtain treatment within one business day of testing positive—was confirmed, as 23 of 26 patients (88%) who were prescribed medications received those medications on the same day as the visit.

As demonstrated by Table 3, roughly one-third of patients who tested positive for COVID-19 then received a prescription from the pharmacist. Some reasons indicated by the pharmacists as to why some patients who tested positive for COVID-19 did not receive a prescription for medication include:

- Patient symptoms were very mild, and he was more concerned with isolating himself
- Patient did not want medications, preferred over-the-counter remedies
- Patient indicated no interest in receiving prescription medication
- Patient here to re-test from elsewhere a couple days ago, not seeking new medication
- Patient has significant potential drug interactions with the prescription medication and therefore risks outweigh benefits in this case

As these comments suggest, there are various reasons why a person may want to know their test status yet not want to take prescription medication. The test service alone does provide immense value to the patient; together with the pharmacist, a patient can make an informed decision about next steps. Pharmacists are highly capable of accurately determining a patient's symptom severity and qualification to receive a test, as indicated by Table 2 and the statistically significant positive test results from those that the pharmacist

evaluated as having Moderate or High symptom severity. The higher-than-expected percentage of positive COVID-19 test results in this study may be due to numerous factors, such as a lack of testing by the general public or the tendency for a sicker population to visit a pharmacy.

One of the most significant and insightful learnings from this research is the high degree of accessibility and quick care that pharmacies provide compared to other providers, as evidenced by Tables 4, 5, and 6. The majority of employed patients (84%) did not have to take time off work to receive the Test and Treat service at the pharmacy, whereas about 70% of employed patients would have had to take time off work to receive this service from a traditional health care provider. Results in Tables 7 and 8 show that patients' awareness of their potential illness (through testing) helped them feel more comfortable with returning to daily activities quickly, regardless of having tested positive or negative. In fact, given that over 85% of survey respondents tested at the pharmacy did not seek additional care beyond the pharmacy, a strong economic argument can be made in favor of this pharmacy-based service.

The average cost of a diagnostic respiratory test and associated service varies depending on the location, type of test, and whether the patient has insurance, and is highly dependent on the provider care setting. Looking at Medicare reimbursement rates for the test product itself can begin to shed light on the economics involved. Although it may vary slightly state-to-state, in general, the Medicare reimbursement rate is \$35.09, \$51.31, and \$95.80 for strep,¹⁰ COVID-19,¹¹ and influenza,¹² respectively, for the rapid molecular test products utilized in this study. It is worth noting that these numbers do not include Medicare payments to the provider/site for providing the care service. In addition, it is generally accepted that private insurance reimbursement rates are higher than those of Medicare,¹³ but one still must consider the out-of-pocket costs that patients may face even if they are insured.

A 2020 Castlight Health report¹⁴ on costs for COVID-19 care, for instance, compares primary care, urgent care, and emergency room out-of-pocket costs for commercially insured populations seeing in-network providers based on 2.5 billion medical claims from 12 large cities in the US. The report's findings are shown in Table 11.

Table 11. Out-of-pocket costs for COVID-19 visits.¹⁴

	PCP	Urgent Care	Emergency Room
2020 average cost	\$235.43	\$352.40	\$2,320.94
2024 cost-adjusted	\$262.98	\$393.63	\$2,592.49

In our research, patients indicated that if not for the pharmacy, about 40% would have visited a primary care provider, about 32% would have visited urgent care, and about 6% would have gone to the emergency department. Using the numbers in Table 11, in a sample of 100 patients there would have been costs of \$10,519.20 for the primary care provider group, \$12,596.16 for the urgent care group, and \$15,554.94 for the emergency department group, making for additive out-of-pocket costs of \$38,670.30 in the traditional health care system. However, given that 100% of these patients visited the pharmacy, at \$70 each this represents \$7,000.00 in costs and a comparative savings of \$31,670.30. It is worth reiterating that these Castlight Health report numbers are based on out-of-pocket costs, so it can be assumed there are additional, significant costs to the health plans for these members as well.

Importantly, the Castlight Health report solely deals with insured patients, but there is much to be said about uninsured patients, who are potentially the most vulnerable. Although some care settings may have different "cash" prices for those without insurance, affordability for this service remains a significant obstacle to care. Across care settings, cost estimates of these respiratory tests range from \$75–135,¹⁵⁻¹⁸ before additional potential visit fees. It's not hard to conclude that each \$70 testing visit with a pharmacist could save hundreds or thousands of dollars that otherwise may have accrued through use of higher acuity care in which multiple providers and potential visit fees may be involved.

It is worth noting that the researchers arrived at the \$70 price point for this project based on estimates of typical out-of-pocket costs for the service itself, as the test may be separately covered by insurance in some cases. It could be argued that with the test, the fair market amount for the service plus test may be closer to \$130–150. The high cost of primary care, urgent care, and emergency department usage is well established,^{19,20} whereas pharmacy visits, as evidenced in this project, are more affordable to both the patient and the health care system. The value that this pharmacy-provided service presents to the health care system is quantifiable, even if only in estimates. In addition, from a return-to-daily-activity perspective, the patient being able to resume occupational duties presents a very positive work-hour-productivity argument.

Table 9 provides insight into groups of rural and urban populations, and it's clear that, if not for the pharmacy, both rural and urban patients would have otherwise had sought care from a primary care physician or urgent care. However, there are some nuances between the two groups, perhaps the most striking of which is that over 25% of the urban

population indicated that, if not for the pharmacy, they may not have gotten tested at all.

Additionally, accessing a primary care provider may take a very long time, perhaps longer even than the course of the illness itself. Research suggests wait times to see a primary care provider may be as long as 26 or 38 days.^{4,21} This hypothetical situation presents several potential cascading issues, such as succumbing to the illness, spreading the illness to others, and more. The fact that the pharmacy was able to serve as an accessible testing location for this group of patients speaks highly of pharmacy's usefulness to the community.

An analysis of the insured and uninsured populations, as presented in Table 10, highlights some important data about these groups. First, it seems that insured patients may be more inclined to visit an urgent care compared to a PCP, while the opposite appears true for uninsured patients. There were no significant differences between the two groups in terms of willingness to pay for the Test and Treat service, nor in how much they would be willing to pay. Uninsured patients were more likely than insured patients to indicate that the pharmacy was located less than two miles from them (41% vs. 29%), but this difference was not statistically significant ($p=0.23$). Importantly, 99% of patients surveyed were more than likely to refer the service to a friend, speaking very highly of the service in general.

These data and results show the importance of having an accessible testing location capable of performing this high-quality testing service, such as the community pharmacy. When properly trained, pharmacists are able to perform rapid molecular diagnostic testing, as recommended by the Infectious Diseases Society of America,²² and provide patients with treatment when appropriate. Having a reliable (very high statistical likelihood of accurate results) test to use for testing service is of the utmost importance, both to instill confidence in patient perception of the service and to correctly diagnose the patient's condition. In addition, a reliable, high-quality test also increases the health care provider's confidence in the test result. The quality of care that community pharmacy provides through CLIA-waived testing using these devices for respiratory illness is equal in quality to that of other care providers, as proven through the findings presented in this manuscript and through the patient feedback gathered herein. The evidence presented in this research makes a very strong case for the crucial role that pharmacists play in detecting illness, triaging patients, and providing economically and clinically beneficial care.

Limitations

Limitations of this research include a short timeframe in which to enroll patients, which led to a lower than desired sample size. In addition, the decision was made to restrict enrollment

to adults, so another limitation was the exclusion of children. A third limitation was prevalence of certain illnesses circulating the US at the time of the research; although COVID-19 appeared to be circulating, it appears that influenza and strep weren't as prevalent.

Conclusion

Patients in this research benefited greatly from the pharmacy-provided Test and Treat services, as pharmacists were able to prescribe and dispense medication quickly. This research has demonstrated the value that pharmacists provide to patients in their community. Pharmacists are able to provide expeditious service with a very high-quality point of care rapid molecular test, and to prescribe and dispense medication when necessary and appropriate, often the same day as the test itself. The research conducted makes a strong case for the expansion of pharmacists' authority to perform these services throughout the US, as patients benefit directly and the health care system benefits through health and economic outcomes. Deploying rapid molecular testing services in community pharmacies throughout the U.S. would greatly benefit patients and create economic savings for the health care system. Legislative action is justified and needed to empower pharmacists to continue making this important intervention in the lives of the patients they serve. Further research is needed to establish the overall cost effectiveness of this model at scale.

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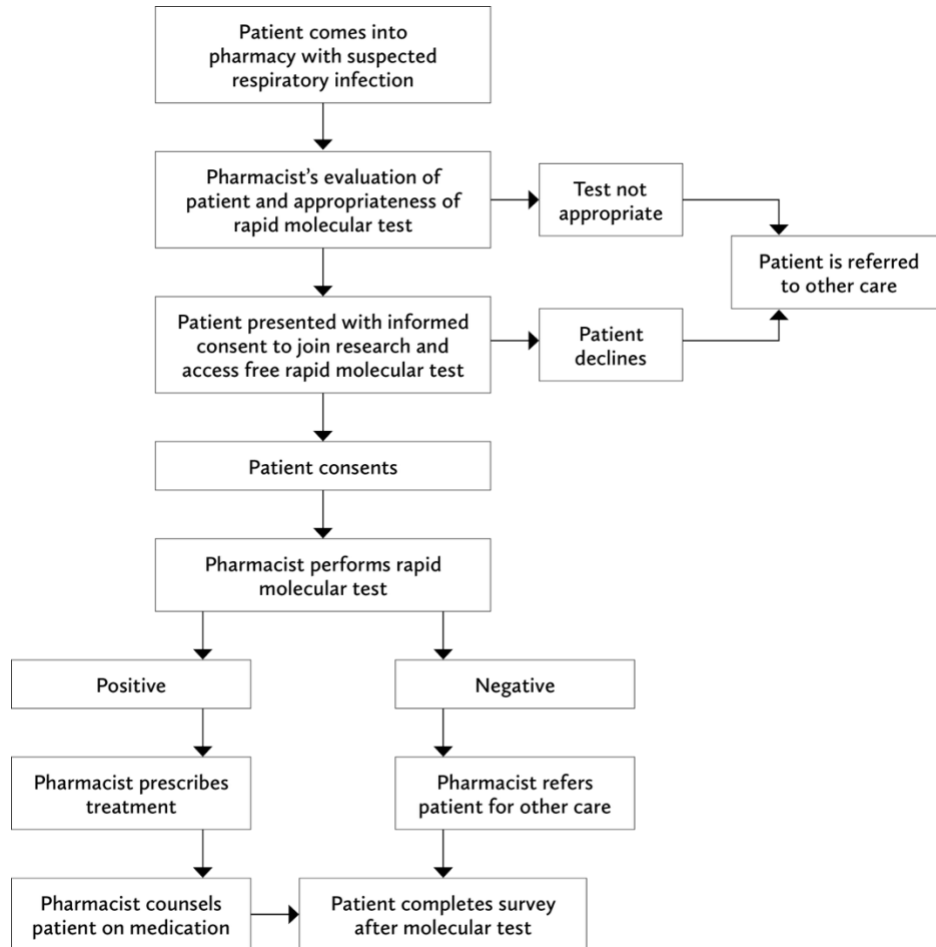
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Appendix A

Rapid Molecular Test and Treat in Community Pharmacies: Patient Care Flow

Appendix B*Questions for Initial Patient Questionnaire, during visit*

1. How far did you travel to get to the pharmacy?
 1. Less than 2 miles
 2. Less than 5 miles
 3. 5–10 miles
 4. Greater than 10 miles
2. How far is the closest traditional healthcare provider (e.g., primary care physician, urgent care, emergency room) from you?
 1. Less than 2 miles
 2. Less than 5 miles
 3. 5–10 miles
 4. Greater than 10
3. Which best describes you?
 1. Employed full-time
 2. Employed part-time
 3. Not employed but seeking work
 4. Not employed and not seeking work
4. Did you have to take time off work to visit the pharmacy?
 - 0 – No
 - 1 – Couple of hours
 - 2 – Half a day
 - 3 – Full day
5. If you sought care from a traditional healthcare provider (e.g., primary care physician, urgent care, emergency room), would you have had to take time off work?
 - 0 – No
 - 1 – Yes
6. How would you rate your satisfaction with this pharmacy-provided point of care test and treat service?
 1. Highly dissatisfied
 2. Dissatisfied
 3. Neutral
 4. Satisfied
 5. Highly satisfied
7. Why did you choose the pharmacy, as opposed to other locations, for this service today? [Select that apply]
 1. Able to see a healthcare provider more quickly
 2. More convenient location
 3. Referred by a trusted source (e.g., family/friend, health care provider)
 4. Already receive other kinds of care at the pharmacy
 5. Do not have a primary care provider
 6. Could not access my primary care provider in the next 24 hours
 7. No cost
8. If not for testing at the pharmacy today, what would you have otherwise done?
 1. Made an appointment with my doctor
 2. Visited an urgent care or clinic
 3. Gone to the emergency room
 4. Used a virtual care/ telehealth service
 5. Would not have sought any test
 6. Other.....explain
9. Although this service was provided at no cost today, how much would you have been willing to pay for this service?
 0. I would not be willing to pay for this service
 1. \$1 – \$49
 2. \$50 – \$99
 3. \$100 – \$139
 4. \$140 or more

10. The technology used by the pharmacist to test you today is known as rapid molecular testing. Other healthcare providers may choose to use rapid antigen testing, as it is lower cost. In the table below we share some of the features of two types of tests.

Rapid Antigen Tests	Rapid Molecular (e.g., NAAT, PCR) Tests
<ul style="list-style-type: none"> • Easy to use with reliable results in 15 minutes or less 	<ul style="list-style-type: none"> • Highly accurate, whether positive or negative
<ul style="list-style-type: none"> • Good predictor of active infection; negative results may require repeat testing or follow-on lab testing 	<ul style="list-style-type: none"> • Fast results during your visit to inform your treatment
<ul style="list-style-type: none"> • Also available over the counter (OTC) for personal use at home (COVID-19 and flu only) 	<ul style="list-style-type: none"> • Reduces need for follow-up visits or waiting for additional lab results to start treatment
<ul style="list-style-type: none"> • One of the most common tests used to detect active virus or bacteria in your body 	<ul style="list-style-type: none"> • It costs more because it is advanced technology, but it provides confidence with treatment decisions

Does the fact that your pharmacists used rapid molecular testing with lab-quality results give you comfort in getting yourself tested and treated in the pharmacy?

0. No
1. Yes

Appendix C***Follow up Questionnaire for Patients, 2–14 days after visit***

1. Was your test positive or negative? (Select one)

If Positive → Compared to getting treated by another healthcare provider, how convenient is it for you to have medication prescribed by your pharmacist?

1. Highly convenient
2. Convenient
3. Neutral
4. Inconvenient
5. Highly inconvenient

If Negative → Compared to getting tested by another healthcare provider, how convenient is it for you to get tested by your pharmacist?

1. Highly convenient
2. Convenient
3. Neutral
4. Inconvenient
5. Highly inconvenient

2. Did anyone else in your household get sick?

0. No
1. Yes

3. In addition to visiting the pharmacy, did you later seek additional care for the symptoms that brought you to the pharmacy for testing and treatment?

0. No
1. Yes

If yes → clinic, hospital, doctor appointment, other

4. How quickly after your visit did you return to your daily activities?

0. Same day
1. Next day after testing
2. 1–3 days after testing
3. 4 or more days after testing

5. How likely are you to recommend pharmacy-based respiratory testing and treatment to a friend?

Scale of 1–10 where ten is highest