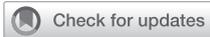




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Community-Based Drive-Through and Walk-Through Testing Centers

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Patients with active coronavirus disease 2019 (COVID-19) must be isolated and quarantined, making rapid identification of disease in large numbers of patients a critical component of the pandemic response. For this to happen, a laboratory must be available with sufficient diagnostic testing capacity, and large volumes of specimens collected and tests run, and with results communicated efficiently. In addition, freestanding test-collection sites must be established away from routine clinical operations to provide dedicated space where large numbers of specimens can be collected. Establishing such a collection site minimizes the chance for virus transmission to other patients and employees during the process of specimen collection and makes testing more convenient for potentially infected individuals. Additionally, a dedicated collection site can help reduce burden on clinics and emergency departments, which may be otherwise overwhelmed with high volumes of patients seeking testing. Herein, we discuss our experience with community-based drive-through and walk-through test-collection sites during the COVID-19 pandemic.

Drive-through test-collection sites have been used worldwide in response to the COVID-19 pandemic.¹ The drive-through collection site has multiple reasons for its popularity. First, only a minimal physical structure is required (generally some form of a tent), which can be rapidly constructed. Second, drive-through testing minimizes exposure of uninfected individuals because those potentially infected remain in their vehicles, thus eliminating waiting rooms with

symptomatic patients and reducing exposure to non-COVID-19 patients seeking care. Drive-through sites also avoid the need for excessive cleaning and potential closing of examination rooms after a nasopharyngeal swab is used to collect a sample for COVID-19 testing, a guidance suggested by the Centers for Disease Control and Prevention.² This guidance initially caused practices to rely heavily on emergency departments to assess patients and collect samples, limiting this resource for patients needing other emergent medical evaluation and treatment. Use of a drive-through collection site can also dramatically reduce consumption of personal protective equipment (PPE). Because no physical space is shared between the health care professional collecting the specimen and the patient, only glove changes are required between tests if no contamination of PPE occurred during the collection process. Finally, in-vehicle specimen collection is more convenient and private for the person being tested.

Although drive-through collection sites have many benefits, some organizations or communities may be served better by walk-through sites. For example, dense urban centers may not have adequate physical space for a drive-through facility, and in some communities, individuals may not have private vehicles. Symptomatic persons who travel to a drive-through test-collection site on some form of public transportation, whether ride service or bus, may place others at risk of infection.³ The act of nasopharyngeal swab collection, which may induce coughing, places ride service drivers at even higher risk of exposure.

The designers of drive-through and walk-through test-collection sites must consider local environmental factors. In locations and times of year when the weather is good, tent structures without wind barriers or heating are sufficient for both types of collection sites. However, at our Mayo Clinic campus in Rochester, Minnesota, for example, there were below-freezing temperatures and snow when both test-collection sites were established. We created outdoor heating areas with gas heaters and windbreaks for outside personnel at the drive-through site. Although we initially planned to use a tent set-up for the walk-through site, modular construction trailers were used instead to provide additional shelter, and the set-up was still rapid. Trailers were also set up for supply storage, including PPE, and as a breakroom for onsite staff.

Careful planning for patient flow is as important as design of the physical structure to ensure a safe and successful test-collection site. A telephone hotline for patients to initiate testing is a key component of the plan. Use of a hotline maximizes efficiency and standardization and lessens face-to-face interactions. At Mayo Clinic, trained nurses answer hotline calls and determine whether an individual should be tested by working through a frequently updated algorithm. Once a decision is made to test, the nurse places the order, which is ready at the drive-through site whenever the person arrives. With the drive-through sites, we do not require appointments because those being tested can wait in their cars. In addition, all of our testing sites have flexible hours to encourage testing, and the sites are open on weekends, as are the nurse-managed hotlines directing persons for testing.

At the walk-through sites, the process is slightly different to avoid clustering of symptomatic patients and waiting at the test site. Once nurse triage or a provider decides an individual needs to be tested, someone from the scheduling team calls to set up a “window” of time for the person to arrive. Scheduling, combined with gate-control personnel at the walk-through facility

entrance, avoids potentially infected individuals congregating.

The development and maintenance of a test-collection site requires collaboration of individuals with diverse skill sets and job functions. Clear and consistent communication across disciplines is vital, along with rapid-cycle quality improvement of processes. In Rochester, we encouraged work across disciplines by creating a command center, which was located in a large room within a building adjacent to our drive-through site, where various specialists and allied health professionals worked together. For example, nurses handling the hotline were quickly able to confer with infectious disease specialists for clarification of the testing algorithm, which allowed for real-time algorithm modification. Scheduling staff were present at the site in case patients arrived who had not previously registered. Our physicians and nurses who specialize in infection control and prevention helped set up the test-collection centers to ensure safe collection practices, PPE management, and guidance on patient flow to minimize potential exposures to patients and employees. Primary care providers, who are accustomed to managing longitudinal care for large numbers of patients, had systems in place to notify patients quickly of test results, and by working with the infectious disease specialists, they rapidly developed expertise in COVID-19 management.

As health care organizations and communities move beyond crisis into a prolonged phase of the COVID-19 pandemic, the role of the test-collection sites will become more defined and may become more diverse. Within days of establishing our drive-through collection site, the adjacent command center was outfitted to perform telemedicine visits for patients with COVID-19. Shortly thereafter, a respiratory symptom clinic was created for in-person evaluations, and an infusion therapy center was added for phlebotomy services. In the near future, all-needs outpatient evaluation sites could be included for individuals

with confirmed and unconfirmed COVID-19 that would allow providers to triage infected persons to higher levels of care, such as the emergency department, only when needed. When a vaccine becomes available, the testing sites could serve as high-throughput vaccine clinics. The testing sites must remain flexible and convenient for patient access and flow, particularly for communities using test-based strategies to discontinue isolation precautions.

In conclusion, dedicated COVID-19 testing sites have proven to be valuable tools in the pandemic response. These sites allow safe, efficient, and convenient specimen collection and are designed to quickly evolve and adapt to patient, organization, and public health needs. Testing will continue to evolve during the coming months as screening becomes more widespread; thus, health care organizations will need to continually re-evaluate services of these sites. Through adaptation, test-collection sites have the potential to be a key factor in containing the COVID-19 pandemic.

ACKNOWLEDGMENTS

Editing, proofreading, and reference verification were provided by Scientific Publications, Mayo Clinic.

This supplement is sponsored by Mayo Clinic Foundation for Medical Education and Research and is authored by experts from multiple Departments and Divisions at Mayo Clinic.

Abbreviations and Acronyms: COVID-19 = coronavirus disease 2019; PPE = personal protective equipment

Potential Competing Interests: The authors report no competing interests.

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REFERENCES

1. Shah A, Challener D, Tande AJ, et al. Drive-through testing: a unique, efficient method of collecting large volume of specimens during the SARS-CoV-2 (COVID-19) pandemic. *Mayo Clin Proc.* 95(7):1420-1425.
2. Centers for Disease Control and Prevention. *Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings.* https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Finfection-control%2Fcontrol-recommendations.html. Accessed May 12, 2020.
3. Pongpirul WA, Pongpirul K, Ratnarathon AC, Prasithsintkul W. Journey of a Thai taxi driver and novel coronavirus. *N Engl J Med.* 2020;382(11):1067-1068.