

Implementation of Primary Care Pandemic Plan: Respiratory Clinic Model

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Objective

In an effort to keep our patients and staff safe while providing necessary care, we implemented phases 2 and 3 of the Primary Care Pandemic Plan as described by Krist et al.¹ We consolidated clinics, we converted nearly all visits to virtual visits and separated the remaining face to face visits into sick and well patient cohorts.

Clinic consolidation

In preparation for the COVID-19 pandemic the University of Michigan consolidated ambulatory care operations. Consolidation achieves 3 major objectives: we free up staff to be redeployed to the inpatient operation, we preserve personal protective equipment (PPE), and most importantly we prioritize the health and wellness of our staff.

Consolidation is predicated on reducing the number of face-to-face ambulatory care visits. Most scheduled visits are either postponed by 2 months—in anticipation of the pandemic subsiding—or converted to a virtual visit, achieving a 90% reduction in face-to-face clinic visits.

Subsequently, we place all staff with patient contact in a rotation which alternates direct patient care time with virtual support or special project work. This preserves the health of the work force, and minimizes the risk that patients and staff are exposed to other staff with subclinical infection.

Clinic consolidation permits temporary physical closure of most of the ambulatory care sites. We are encouraging all support staff, nurses, and allied health personnel without direct patient care to work from home. We are consolidating the few remaining face-to-face clinic visits from each site into 3 sites of ambulatory care. One site, the West Ann Arbor Health Center (WAAHC), is the focus of this article. Prior to consolidation, WAAHC was home to > 20 medical and surgical specialties as well as a primary care cohort including geriatrics, internal medicine, pediatrics, and ob-gyn.

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Consolidation has relocated most of the medical and surgical specialties away from WAAHC and to the main medical campus of the University of Michigan. Consolidation has also relocated three Family Medicine, four General Medicine, three Pediatric, one Geriatric and one Internal Medicine/Pediatric clinics into the WAAHC which now serves as a Primary Care regional site.

Leadership and communication within consolidated primary care clinics

Consolidating 12 primary care clinics into WAAHC creates operational and communication challenges, requiring additional structure for leadership and communication. We developed a leadership team for Primary Care at WAAHC that supports frequent process changes and communication to staff. A pediatrician leads the team comprised of representatives from Family Medicine, Internal Medicine and Pediatrics, Geriatrics, and Obstetrics and Gynecology. The pediatrician lead partners with the Medical Director of the WAAHC for overall leadership. As the team develops new processes each team member cascades the information to their peers and to the leaders and staff of their respective home site clinics.

Separation of “sick” and “well” patients

We separate “sick” patients—those with acute respiratory symptoms concerning for COVID-19—from the general population of “well” patients by taking advantage of the physical layout of our building as well as multiple layers of symptom screening to identify the sick patients.

The physical layout of our building includes a two story clinical wing opposite a one story Infusion Center with adjacent laboratory and radiology space. The two sides share a common lobby. However, the Infusion Center is also accessible from the parking lot via an employee entrance. We use the employee entrance to bring sick patients into the building and then directly to the Infusion Center which we have converted into the Respiratory Clinic. **Figure**

When answering patient appointment requests, the call center staff members screen patient for respiratory symptoms. Patients with respiratory symptoms are

redirected call to a designated COVID-19 Hotline Nurse Triage Pool. Nurses then assess patients for risk factors and order testing when appropriate. **Boxes 1 and 2**

If a patient does not qualify for testing but has symptoms concerning for COVID-19 infection, the nurse counsels the patient how to isolate at home and manage mild to moderate symptoms. If the nurse determines that the patient requires additional evaluation, a virtual visit with a physician or APP is provided. If the provider concludes that a face-to-face visit is necessary the staff schedule an appointment in the Respiratory Clinic.

Symptom screening on patient presentation

Despite our best efforts to perform symptom screening at the time of appointment scheduling, patients scheduled for routine visits (e.g. well-child visit with immunizations) occasionally screen positive upon arrival in the well clinic. Guest Services personnel help to identify symptomatic patients or staff as they enter the lobby. We screen all patients and staff for symptoms. We require all staff members, symptomatic patients and symptomatic family members/attendants to wear masks. However, some patients evade detection at this level and an additional layer of symptom screening is necessary as the patients arrive at the clerical check in counter. In the event that an unmasked patient arrives at the clerical check in and screens positive, we request that the patient and the attendant put on masks.

Respiratory Clinic care model

The Respiratory clinic at WAA address elements of both Phase 2 and Phase 3 of the Krist model¹. The clinic serves as a mechanism to implement testing and evaluation protocols in addition to keeping patients away from the Emergency Department and hospital. The scope of illness in the WAA Respiratory Clinic encompasses all acute respiratory symptoms including cough, shortness of breath, sore throat, fever. Because there is no specific treatment for COVID-19, care in the Respiratory Clinic emphasizes clinical assessment for stability, testing, and diagnosis.

The Respiratory Clinic has access to pulse oximetry, rapid strep antigen test, CXR, EKG, and basic blood tests. The clinic uses portable CXR and bedside phlebotomy services to minimize patient traffic to the radiology and pathology suites. Although COVID-19 Hotline nurses make the majority of all COVID-19 testing decisions, providers working in the Respiratory Clinic are authorized to order COVID-19 tests if the patient meets the criteria after formal risk assessment. The providers use decision support algorithms in the electronic medical record to guide decision-making in regard to testing. We update this algorithm as criteria evolve.

Additional services available in the Respiratory Clinic include IV hydration, antiemetic therapy, steroids, limited antibiotics, HFA inhalers (not nebulized medication), diuretics and supportive medications such as acetaminophen and ibuprofen. **Table**

Patients arriving for the Respiratory Clinic call the clerical staff from the parking lot. The clerical staff member performs the check-in process, dons PPE, and meets the patient in the parking lot. The staff member provides the patient with a mask with instructions that it must be worn for the entire visit. The staff member instructs the patient not to touch any doors or walls and escorts the patient through the employee entrance that is designated for Respiratory Clinic patients. Once the visit is complete, the staff member escorts the masked patient out of the health center.

The Respiratory Clinic contains 6 private rooms with bathrooms, and 11 curtained bays. Small children have difficulty remaining masked, so these patients are seen only in private rooms. Staffing must include providers, nurses, and medical assistants who are certified to care for pediatric populations.

Staffing requirements

The Respiratory Clinic model requires coverage for pediatric and adult patients. We maintain general staffing at 1 physician or Advanced Practice Provider per 8-10 patients with 2 nurses, and 3 medical assistants available for support. Patient volume and acuity is increasing over time in accordance with that observed in the inpatient setting. Many patients now arrive in the Respiratory Clinic with symptoms that prior to

pandemic would have presented to the ED, e.g. chest pain, possible PE, dementia/delirium, or dehydration and our staffing model will continue to evolve with the pandemic.

Lessons learned:

- Frequent consultation with the Infection Prevention and Epidemiology (IPE) experts is valuable. This allowed us to modify our room cleaning process to meet changing requirements. Initially we let each room sit idle for 60 minutes prior to cleaning. As new information became available, the guidance changed and we are now performing surface cleaning without any idle time.
- IPE was also very helpful when we initially contemplated using the Infusion Center for the Respiratory Clinic. Staff were hesitant to use infusion bays separated by curtains rather than doors due to concerns about possible droplet contamination of the curtains. IPE advised that the curtains should be treated as walls and thus do not need to be surface cleaned after every patient.
- Since the beginning of the pandemic in Michigan, testing availability has been limited. Initially, tests were only available through the Michigan Department of Health and Human Services. Subsequently a couple of different commercial tests were available but overall access to testing was extremely limited during this time. Now we have an internal test but widespread testing is still not available. As the various test kits and companies changed the process for ordering tests and obtaining results changed. Results were frequently delayed, and sometimes confusing to interpret. The use of internal tests has greatly simplified this process.
- Staff are anxious about the possibility of mixing the sick and well patients as well as the risk of contracting illness personally. Daily communication is necessary to listen to concerns, update and reinforce processes, This is particularly true for processes that change over time, such as symptom and travel screening or use of PPE. For example, early on in our response to the COVID-19 crisis, full PPE with N-95 masks were recommended for use in all COVID-19 suspect patients. As the pandemic progressed and more information became available, we modified the requirement of N-95 masks for aerosolized procedures only. Providers and staff were concerned when the

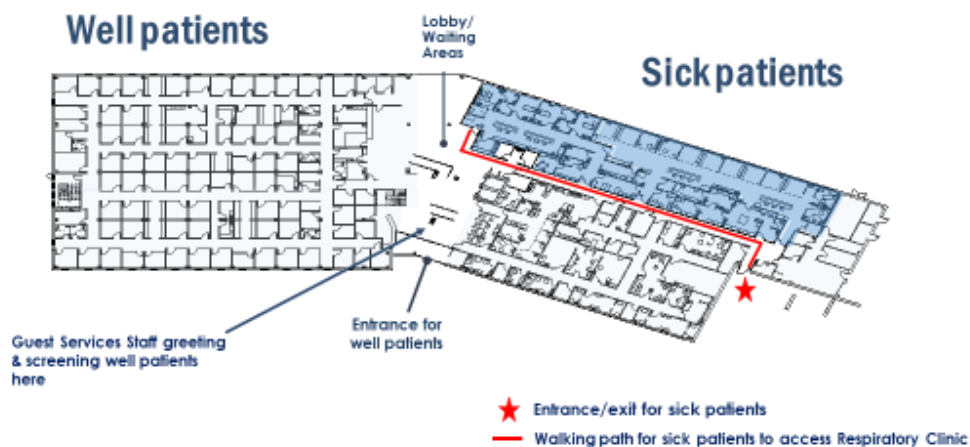
PPE recommendation appeared to be less protective over time. Education was necessary to reassure employees that more PPE did not necessarily equate to better protection.

References

1. H. Krist, Jennifer E. DeVoe, Anthony Cheng, and Thomas Ehrlich. Posted on Annals of Family Medicine COVID-19 Collection courtesy of Alex H. Krist

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Figure 1: Geographic Separation: Sick vs Well



Box 1 Respiratory symptom screen during COVID-19 pandemic

1. Do you have symptoms of fever, cough, and/or shortness of breath?
2. Travel to China, Japan, South Korea, Iran or Italy within the last 14 days? *This question was retired after [insert date].*
3. Close contacts diagnosed with or tested for coronavirus? *This question was retired after [insert date].*
4. Do you live with health care provider? *This question was added after [insert date].*

Box 2: COVID-19 Testing Criteria for Ambulatory Patients (Adults and Children)

1. Patients need to have at least 2 out of 3 of the following symptoms in order to qualify for testing*:

- Fever ($T > 100.4^{\circ}\text{F}$)
- New cough
- Shortness of breath, difficulty breathing, or hypoxemia

2. At least one of the following risk factors for COVID-19 severe outcomes or outbreaks:

Populations associated with severe COVID-19 or outbreaks of epidemiologic importance:

- Age ≥ 65
- Compromised immune system (AIDS, organ or HSC transplant, immunosuppressive therapy)
- Healthcare worker or immediate household contact of one
- Hemodialysis patients
- Resident of nursing home or other long-term care facility
- Residents of congregate living settings
- First responders

Younger, healthy individuals with mild illness do not need to be tested. They should stay home for 7 days or 72 hours after symptom resolution, whichever is longer. Additionally, testing is not recommended in persons who are asymptomatic. A negative test result does not rule out an infection.

*Criteria for testing changed over time based on epidemiology and supply chain limitations.

Table Medications available for administration in the Respiratory Clinic

Medication	Method of Administration
Solumedrol	Injection
Prednisone	Oral
Dexamethasone	Oral
Ondansetron	Oral
Prochlorperazine	Injection
Diphenhydramine	Oral
Epi-Pen	Injection
Ceftriaxone	Injection
Cefazolin	Injection
Furosemide	Oral
Albuterol	Inhaled
Ipratropium	Inhaled
Acetaminophen	Oral
Ibuprofen (pediatric)*	Oral

* The WHO recommends against the use of non-steroidal anti-inflammatory medications during the pandemic, based on anecdotal reports that patients given non-steroidal anti-inflammatory medications had worsening of COVID-19 illness.