These guidelines are designed to simplify and streamline care during the COVID-19 pandemic. They are created to assist healthcare providers in clinical decision making. The ultimate judgment about care of a particular patient will be made by the healthcare provider and patient in light of all the current circumstances.

Guideline developed by Dr Pieter Cohen, Dr Lara Hall, Dr Kathe Miller and Dr Julia Randall in consultation with CHA’s Department of Infectious Disease and Department of Pulmonology.

See Addendum 1 for Differential Diagnosis Considerations
See Addendum 2 for Special Considerations for Pregnant Women
See Addendum 3 for Special Considerations for Postpartum Women
See Addendum 4 for Respiratory Clinic on Site Medications and Pharmacy Considerations
See Addendum 5 for Natural History of COVID-19

Testing:
- Influenza A/B PCR testing as clinically indicated
- Rapid strep testing will not be performed; treat empirically as indicated
- COVID testing is recommended based on CHA guidelines
  - If rapid COVID testing becomes available in Respiratory Clinic, it is recommended to be reserved for the following:
    - healthcare workers
    - patients living in close quarters (homeless shelter, nursing home, people who attend hemodialysis, etc)
    - patients whom we suspect may need ED care within 72 hours
    - pregnant patients in 3rd trimester

Imaging:
- CXR:
  - Not necessary before empirically treating community acquired pneumonia
  - Not recommended routinely in cases of suspected COVID-19
  - Only recommended if the result will significantly change management
- Note: (only off-site at Somerville Hospital)
  - Order stat CXR with wet read to ordering provider
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○ Page “Radiology Managers” on Alpha-page or pager ID 9899 in extend [if this did not work: we paged using alpha-pager “Radiology Somerville - Rad Tech Pager” which did]; include patient name, potential COVID-19 diagnosis and that patient is going to Somerville Hospital for CXR. Tell the patient to go directly to Radiology. Patients will be sent home as soon as imaging is complete.

Treatment:
Presumed/confirmed COVID-19:

● Supportive care
● NSAIDS in patients with suspected/confirmed COVID-19 (as antipyretic or in patients taking NSAIDs for other reasons prior to COVID-19 diagnosis) are not contraindicated.
  ○ Regular NSAID precautions still hold – use with caution in older populations, kidney disease and other comorbidities
● ACE-I and ARB: not contraindicated – may continue or start these medications in patients who have indications for them (e.g. reduced EF or CAD) including in setting of suspected/confirmed COVID-19.
● Given the potential of cardiovascular complications in COVID-19 patients, all patients with active prescriptions for aspirin and statins will be counseled on the importance of compliance with these medications during and following recovery from their illness. However, we do not recommend starting aspirin or statin to treat COVID-19.
● In cases where COVID-19 is the only diagnosis (e.g., no other secondary diagnosis such as COPD exacerbation/asthma exacerbation): steroids, antivirals, antibiotics, immunomodulators, monoclonal antibodies and other agents, including hydroxychloroquine/chloroquine, are not recommended to treat COVID-19 in the outpatient setting. Steroids, antivirals, and antibiotics may be indicated for other illnesses (see below) seen in Respiratory Clinic.

Community Acquired Pneumonia:

● Augmentin (amoxicillin/clavulanate) 875/125 PO BID x 5 days
● If PCN allergy:
  ○ nonpregnant: use levofloxacin 750 mg PO qday x 5 days
  ○ pregnant (no anaphylaxis with PCN) cefpodoxime 200mg BID x 5 days
● PNA in setting of COPD: Augmentin (as above) plus doxycycline 100 mg PO BID both for 5 days

COPD exacerbation:

● Doxycycline 100 mg PO BID x 5 days (take with food)
● Corticosteroids:
  ○ Prednisone burst or taper as indicated
  ○ Inhaled corticosteroids as indicated
  ○ Use of steroids (PO and inhaled) in the outpatient setting: use if clinically indicated for conditions such as asthma and COPD maintenance or exacerbation, even in the setting of suspected/confirmed COVID-19 > this includes po steroid burst or taper and/or starting/restarting/increasing dose of inhaled corticosteroids.

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- Other MDI as clinically indicated
  - Combivent and albuterol MDI with spacer available on-site to be clinically administered (in place of nebulizer)
  - Note: patient should be instructed to use MDI preferentially over nebulizer at home if they do not live alone

Asthma exacerbation:
- Corticosteroids:
  - Prednisone burst as indicated
  - Inhaled corticosteroids as indicated
  - Use of steroids (PO and inhaled) in the outpatient setting: use if clinically indicated for conditions such as asthma and COPD maintenance or exacerbation, even in the setting of suspected/confirmed COVID-19 > this includes PO steroid burst or taper and/or starting/restarting/increasing dose of inhaled corticosteroids.
- Albuterol MDI with spacer as clinically indicated
  - Albuterol MDI with spacer available on-site to be clinically administered as needed (in place of nebulizer)
  - Note: patient should be instructed to use MDI preferentially over nebulizer at home if they do not live alone

Strep Throat Treatment:
- Empiric penicillin 500mg BID x10 days

Influenza:
- Oseltamivir
  - Should be reserved for use in the first 72 hours of presentation with positive influenza PCR test
  - May treat before influenza result is available in certain circumstances (e.g., high suspicion for influenza with known influenza close contact)

Bacterial sinusitis:
- Nasal corticosteroid, decongestant, neti-pot, other supportive care
- If severe symptoms: Augmentin 875 mg/125 mg BID x 10 days

CHF exacerbation or other cardiac pathology:
- Treat as clinically indicated (e.g., diuretics for CHF exacerbation)
- No change in routine management for CHF exacerbation or other cardiac pathology, even in setting of presumed/confirmed COVID-19
- See note above regarding ACE-I/ARB

Criteria to provide home O2 oximeter
Patients who meet the following criteria:
  1. Known or suspected covid AND either #2, #3, #4 or #5

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2. Resting O2 sat of < 95% on room air AND age > 35 yo  
   Or  
3. Any age with resting O2 sat > 93% on room air but with O2 sat < 90% with ambulation  
4. High-risk of COVID complications and dyspnea - even if no hypoxia  
5. Post-hospitalization for COVID

Patients excluded:  
   1. Patient does not already have an oximeter at home  
   2. Patient being transferred to ED  
   3. Patients who do not have the ability to call  
   4. Patients who do not have the ability to accurately use the oximeter  
   5. Patients who cannot understand protocol to interpret O2 Sat and notify provider

Transfer to ED:  
Consider transfer to ED if one or more of the following:*  
   ● Room air O2 saturation below 92% or ambulatory O2 saturation below 90%  
   ● Respiratory distress not relieved by RC treatments  
   ● Serious concern for pulmonary embolism  
   ● Serious concern for cardiac event and/or severe persistent chest pain  
   ● Inability to orally hydrate  
   ● Confusion  
   ● Hemodynamic instability

* The ultimate judgment about care of a particular patient will be made by the healthcare provider and patient in light of all the circumstances presented by that patient.

Additional Education on the Clinical Course of COVID-19 in the Ambulatory Setting

Video 1: Natural history of COVID in ambulatory setting  
Video 2: Distinguishing COVID from other common diagnoses in the ambulatory setting during the pandemic

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### Addendum 1: Differential Diagnosis of patients evaluated in Respiratory Clinic

<table>
<thead>
<tr>
<th>Differential Dx</th>
<th>Relevant Hx + Symptoms</th>
<th>Relevant Signs</th>
<th>Potential Treatments</th>
</tr>
</thead>
</table>
| Community acquired pneumonia | delayed onset of cough, fever chills, pleuritic chest pain, especially productive cough | asymmetrical pulmonary exam w/ decreased or bronchial breath sounds | Augmentin (amoxicillin/clavulanate) 875/125 PO BID x 5 days  
If PCN allergy:  
*nonpregnant: levofloxacin 750 mg PO qday x 5 days  
*pregnant (no anaphylaxis with PCN) cefpodoxime 200mg BID x 5 days  
Pneumonia AND COPD: Augmentin (as above) plus doxycycline 100 mg PO BID both for 5 days |
| Legionella pneumonia | Very similar to COVID but typically fever & fatigue precede cough, GI symptoms can be present | Rales or other signs of consolidation on lung exam | Levofloxacin 750 mg PO qday x 7 days |
| Post-viral pneumonia | Initial viral illness, followed several days later by worsening fever & productive cough | Rales or other signs of consolidation on lung exam | See community acquired pneumonia above. |
| Asthma exacerbation | Hx asthma | wheezing or poor air movement | Albuterol MDI + spacer  
Prednisone 40mg PO Daily x5 days burst |
| COPD exacerbation | Hx of COPD | Wheeze/rhonchi | Prednisone 40mg PO Daily x5 days burst (or taper if has required in past)  
AND Doxycycline 100 mg PO BID x 5 days (take with food) |

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<table>
<thead>
<tr>
<th>Condition</th>
<th>Presentation</th>
<th>Diagnosis</th>
<th>Management/Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pulmonary embolism</strong></td>
<td>Hx of precipitating factor, travel, sedentary, OCPs etc</td>
<td>Tachypnea (shallow, rapid breaths) &amp; tachycardia with normal O2 Sat and normal pulm exam, minimal or no fever</td>
<td>Send to ED for work-up based on clinical suspicion</td>
</tr>
<tr>
<td><strong>CHF exacerbation or other cardiac pathology</strong></td>
<td>Hx of CHF</td>
<td>Bibasilar crackles, elevated JVD, peripheral edema</td>
<td>Diuretics, consider ED</td>
</tr>
<tr>
<td><strong>Influenza</strong></td>
<td>Sudden onset of multiple symptoms</td>
<td></td>
<td>Pt will be getting a provider call at 24hrs w/ result and will prescribe if necessary oseltamivir 75 mg PO qday x 5 days, should be reserved for first 72hrs</td>
</tr>
<tr>
<td><strong>Strep throat</strong></td>
<td>Fever and sore throat</td>
<td>Exudate</td>
<td>Empiric <strong>Penicillin</strong> 500mg BID x10 days</td>
</tr>
<tr>
<td><strong>Anxiety/panic attack</strong></td>
<td>Anxiety</td>
<td></td>
<td>Relaxation techniques</td>
</tr>
<tr>
<td><strong>Seasonal allergies</strong></td>
<td>Itching, sneezing</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bacterial sinusitis</strong></td>
<td>&gt;7 days of sinus pain + discharge</td>
<td>Sinus tenderness, unilateral purulent nasal discharge</td>
<td>Sinus rinse (Neilmed) If severe sx: Augmentin 875 mg/125 mg PO BID x7 days</td>
</tr>
<tr>
<td><strong>Acute pericarditis</strong></td>
<td>Chest pain – typically sharp and pleuritic, improved by sitting up and leaning forward</td>
<td>Pericardial friction rub (listen on left sternal border with pt leaning forward</td>
<td>ED for additional w/u (only if ED unavailable consider empirically treating with aspirin 650 mg PO TID)</td>
</tr>
<tr>
<td><strong>Inhalation injury</strong></td>
<td>Exposure to heat, smoke or chemicals</td>
<td></td>
<td>Remove exposure, call poison control if needed</td>
</tr>
</tbody>
</table>

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COVID-19 | Sudden or delayed onset of viral sx, loss of smell/taste, tachypnea, tachycardia, fatigue | Use of accessory muscles, abdominal paradox, acute respiratory distress Decreased breath sounds |
---|---|---|
Rash | COVID-19 may cause a variety of rashes including lesions on feet that might be similar to other rheumatological illnesses | Variety of presentations including chilblains, livedo reticularis, necrotic-type lesions on toes | Consider eConsult for any rashes. If lesions last for more than 2-3 weeks, then refer to rheum or derm for additional evaluation to consider other diagnoses |

IMPORTANT NOTE: Patient might have any of the above IN ADDITION to COVID-19 infection and this should also always be considered.
Addendum 2: Respiratory Clinic Care of Pregnant Patients

Pregnancy is a relative immunocompromised state, and pregnant women are considered to be higher risk for more severe disease, though data is limited.

Additionally, infection control is specifically of concern for this population, to avoid them bringing COVID19 infection into clinical areas generally occupied by healthy but at risk patients, such as in prenatal care centers and to take appropriate precautions should they need care on labor and delivery/maternity.

If at any time, there are questions about management of Pregnant Patients with COVID positive results:

- If in first trimester (up to 12 weeks) please call x2808 and ask to speak to the “triage doc of the day”
- If second or third trimester (13wks-41wks) please page OB provider (PA or MD) on call in staffnet
- If unable to reach a CHA provider, you can consider paging the BIDMC MFM Remote advice pager (36244) during daytime M-F hours to discuss potential consults. Main switchboard number is 617 667 7000

Special considerations for pregnant patients:
See also Pregnancy Specific COVID Guidance for Community Management for additional information on breastfeeding and lactation and further clinical recommendations

Consider RAPID COVID19 testing (if available) on pregnant patients in their THIRD TRIMESTER to help with management and infection control planning, especially in case of need for care on labor and delivery.

Specific considerations for prenatal patients In Respiratory Clinic:

- Pre-viable pregnancies (less than 22 weeks) RC evaluation of fetus will be limited to use of doppler to confirm fetal heart rate if gestational ages between 15 and 22 weeks. Below 15 weeks without ob related symptoms, no fetal assessment.
- Above 22 weeks RC evaluation will be limited to use of doppler to confirm fetal heart rate, and call to on-call OB if FHR sustained below 120 or above 160 bpm
- Blood Pressure will be checked on prenatal patients above 22 weeks, as pulmonary edema can be a consequence of severe preeclampsia - if >140/90 call to OB
- Any concern for preterm labor or other specifically OBSTETRICAL concerns will trigger a call to the on-call OB GYN
- Pregnant women beyond 22 weeks gestation with O2 saturation consistently below 95% will be transferred to the emergency department

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When to consider inpatient care for a pregnant person at ANY time in their pregnancy:

- **SMFM-defined** moderate to severe signs and symptoms:
  - Moderate disease is defined by evidence of lower respiratory tract disease with clinical assessment (dyspnea, pneumonia on imaging, abnormal blood gas results, refractory fever of 39.0 °C /102.2 °F or greater not alleviated with 2 acetaminophen) while maintaining an oxygen saturation of greater than 93% on room air at sea level.
  - Severe disease is defined by a respiratory rate greater than 30 breaths per minute (bpm), hypoxia with oxygen saturation less than or equal to 93%, a ratio of arterial partial pressure of oxygen to fraction of inspired oxygen of less than 300, or greater than 50% lung involvement on imaging
- Oxygen saturation less than 95%
- Pregnant COVID-19 patients with comorbid conditions, eg, uncontrolled hypertension, inadequately controlled gestational or pregestational diabetes, chronic renal disease, chronic cardiopulmonary disease, or immunosuppressive states (intrinsic or medication-related)
- Pregnant COVID-19 patients with fevers greater than 39 °C despite acetaminophen, raising concern for secondary hemophagocytic lymphohistiocytosis (sHLH) or “cytokine storm syndrome.” sHLH is a fulminant and often fatal hypercytokinemia associated with multi-organ failure. The disease is defined by unremitting fever, cytopenia, and high ferritin levels.
- Pregnant patients with clinical findings of COVID-19 that warrant pharmacologic treatments should be considered for inpatient monitoring. At this point in time, all pharmacologic agents (hydroxychloroquine, remdesivir, tocilizumab, convalescent plasma) used in COVID-19 are considered investigational, and drug efficacy in COVID-19 remains unclear

See also [COVID-19 Inpatient Pregnancy and Post-Partum Management](#)

Most care is not different for pregnant/postpartum patients seen in RC - specifically

- Inhaled therapies are not different for pregnant patients
- Oral steroids, if clinically indicated for conditions such as asthma, are not different for pregnant patients.
- Antibiotic therapy, if clinically indicated for CAP, amoxicillin/clavulanate 875 bid for 5 days
- If PCN allergic but not anaphylaxis, consider cefpodoxime 200mg bid for 5 days
- If history of anaphylaxis consider a call to outpatient ID, as they currently are trying to avoid use of azithromycin. Doxycycline is NOT absolutely contraindicated.
Addendum 3 - Respiratory Clinic Care of Postpartum Patients

Women who have (or have suspected) COVID19 and have recently given birth have the stressors associated with COVID19 in addition to stress associated with caring for a newborn. There is still little information on possible long term sequelae for these patients and their newborns. While data is lacking, these stressors are expected to increase the risk of postpartum depression. For this reason we will be co-scheduling newborn weight checks up to the 2 week infant well check with a postpartum check with the birth mother. Additionally, patients with other risk factors such as preeclampsia or gestational hypertension will need increased surveillance after delivery at Respiratory Clinic until they are medically cleared to return to mainstream postpartum care.

Special considerations for postpartum patients:

Please consider using the current EPIC postpartum smart-set to help with documentation, in addition to our COVID19 related smart sets as indicated. The smart-set was designed mostly for the 4-6 week postpartum visit, however most elements are appropriate for earlier postpartum encounters.

Respiratory clinic will co-schedule mothers with newborns for all newborn weight checks up to 2 weeks of age (after which time newborns should be able to return to mainstream well infant care) in order to provide additional support to these vulnerable new parents.

Main areas to consider:

- Vital signs, particularly blood pressure for all postpartum patients. Contact OB team for BP >140/90. (Page OB provider (PA or MD) on call in staffnet)
- Evaluation of vaginal bleeding, and symptoms of severe anemia/hypovolemia
- Evaluation for signs of infection (mastitis, endometritis especially)
- Evaluation for urinary and bowel symptoms
- Mental wellness - feelings of depression, hopelessness, or inability to care for newborn
- Newborn nutrition
- **Breastfeeding and lactation - which should have been addressed in the inpatient setting:**
  - Breast milk is the best source of nutrition for most infants. However, much is unknown about COVID-19. Whether and how to start or continue breastfeeding should be determined by the mother in coordination with her family and obstetrical providers. Because people may be able to spread COVID-19 without symptoms and because COVID-19 illness is spreading in communities across the country, a breastfeeding mother should take all possible precautions to avoid spreading the virus to her infant. This includes washing her hands before touching the infant and wearing a cloth face covering over her nose and mouth, if possible, while feeding at the breast. If expressing breast milk with a manual or electric breast pump, the mother should wash her hands before touching any
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pump or bottle parts and follow recommendations for proper pump cleaning after each use. If the mother is symptomatic, consider having someone who is well bottle feed the expressed breast milk to the infant.
○ If breast feeding and would benefit from lactation consult, Lauryl Ramakrishnan is a CHA Lactation consultant and has telehealth availability. Send charts to her via EPIC for outreach.
○ Alternate options for lactation consultant:
  ■ As of 5/3/20, NewEnglandMothersFirst.com and LCHomeVisits.com are doing televists for lactation right now.
  ■ New England Mothers First isn't charging a copay for their visits -- no upfront fees and they bill MassHealth and most other plans.
● Postpartum contraception - ensure that a method has been planned and implemented, this should be noted in the discharge summary. As of 5/3/20 CHA has no recommendations for or against Estrogen containing contraceptive methods.
● Anticoagulation: no specific recommendations at this time
● Home Safety - is there domestic violence (this has surged since COVID19)? Is there stable housing? Access to food? Nutrition: anorexia and anosmia may persist for weeks post-hospitalization
  ○ Assess for food scarcity, other barriers such as loss of income and/or social isolation are barriers > use smartphrase in Epic.COVIDFOODINSECURITY if this has not yet been completed at a previous visit
  ○ See Food Resources
● Behavioral Health needs / Domestic Violence:
  ● PCBHI referral: acute and non-acute PCBHI referral

See also COVID-19 Inpatient Pregnancy and Post-Partum Management

Most care is not different for pregnant/postpartum patients seen in RC - specifically
● Inhaled therapies are not different for pregnant patients
● Oral steroids, if clinically indicated for conditions such as asthma, are not different for pregnant patients.
● Antibiotic therapy, if clinically indicated for CAP, amoxicillin/clavulanate 875 bid for 5 days
● If PCN allergic but not anaphylaxis, consider cefpodoxime 200mg bid for 5 days
● If history of anaphylaxis consider a call to outpatient ID, as they currently are trying to avoid use of azithromycin. Doxycycline is NOT absolutely contraindicated.

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Addendum 4: Respiratory clinic on-site medications and pharmacy considerations

On Site medications for dosing in clinic:
- Prednisone 20mg tablets
- Prednisolone syrup 15mg/5cc
- Dexamethasone injectable 4mg/cc
- Acetaminophen tablets (325) and liquid (160mg/5cc)
- Ibuprofen tablets (200) and liquid (100mg/5cc)
- Narcan nasal spray
- Albuterol MDI*
- Ipratropium MDI*
- Combivent MDI*
- Spacers (for use with ALL MDI)*

*MDI and spacers will be sent home with patients

How to use MDI with spacer

Information:
- Give day 1 dose in clinic when possible (e.g. day 1 of prednisone burst)
- Offer patient options - delivery, curbside, or have friend/family pick up meds
- If delivery option, assume patient may not receive meds until following day
- Discuss process for delivery with patient

CHA PHARMACY INFO
- Cambridge Hospital: M-F 830a-8p and Sa/Su 9a-3p  617-665-1438
- Gore Street (East Cambridge) M-F 8-5  163 Gore St, Cambridge 617-499-6690
- Malden M-F 8-5, 195 Canal Street, Malden 781-338-8990

Pharmacy Pick-up, Delivery and Curbside Information:
1. Cambridge East and Malden Offer Curbside Pick-up (see hours above)
   a. Patient drives up to curbside
   b. CH staff greets patient
   c. Patient informs staff member that they are there for pick-up+/-7777777777
   d. Staff will go in and get medication for patient
   e. Give 1 hour minimum so prescriptions are ready

2. CHA Pharmacy Delivery
   a. All medications can be delivered if prescribed prior to 12 pm or will be delivered the next day. Meds can be delivered statewide.
   b. Provider prescribes medication to appropriate CHA pharmacy (if they live close to Malden, prescribe to Malden pharmacy). This is not very important. Pharmacies do communicate with each other.

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c. Patient has to call CH pharmacy to confirm medication delivery, confirm that they will stay home the day of delivery, and discuss payment.
   i. CH pharmacy number (617) - 665 -1438
   ii. Malden Pharmacy: 781-338-8990

d. Patient can request preferred language when the pharmacist picks up the phone
The natural history of SARS-CoV-2 infection: clinical observations from an ambulatory COVID-19 clinic

In March, 2020, weeks before the coronavirus disease 2019 (COVID-19) pandemic surge was predicted to arrive in Massachusetts, two of us (JJ, LH) designed an ambulatory clinic specifically to care for patients infected with SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2). None of the hundreds of research reports published to date addressed caring for patients infected with SARS-CoV-2 in the ambulatory setting, and it became clear that one of the first challenges we faced was to gain an understanding of the typical presentation and natural history of mild and moderate COVID-19 to guide our care during the pandemic.

While we had access to state laboratory real-time reverse transcription polymerase chain reaction diagnostic testing for SARS-CoV-2, the delay of four to five days made the results impractical for clinical management. Routine laboratory studies, likewise, did not appear to be clinically useful. We focused, instead, on trying to discern patterns from a detailed history and limited physical exam that might distinguish COVID-19 from other similar illnesses.

Initially some cases of COVID-19 appeared to be identical to influenza, upper respiratory tract, lower respiratory tract infections and community acquired pneumonia. After caring for more than a thousand patients in our COVID clinic, however, we have come to suspect that many moderate and severe cases of COVID can be diagnosed by a careful history.

At the outset, patients with SARS-CoV-2 infection may be asymptomatic or experience symptoms indistinguishable from a variety of acute viral and bacterial infections. In a retrospective study of 191 patients admitted to two hospitals in Wuhan, China, the initial several days of SARS-CoV-2 infection involved fever (94%) and cough (79%).(1) But these presentations were likely biased by being only those of hospitalized patients and hospital admission was often predicated on testing positive for COVID-19 in an ambulatory “fever clinic”. Referral to a fever clinic in Wuhan, China required the presence of both fever and at least one respiratory symptom, likely limiting the spectrum of disease described in these and other studies of hospitalized patients in Wuhan, China.(2, 3)

In our clinic, patients with various permutations of mild symptoms including nasal congestion, cough without fever, sore throat, diarrhea, headache, myalgias, back pain and fatigue have tested positive for COVID-19. We have also cared for many patients who experienced severe symptoms during the initial days including fever, cough, myalgias and exhaustion. These initial days of infection can range from mild upper respiratory symptoms, cough and fatigue suggestive of bronchitis, sore throat and fever, abdominal pain with diarrhea or influenza-like illnesses. Of note, though fever is a common symptom over the course of COVID-19, temperature elevations can be mild, particularly at the outset of illness.(4) One of the only early hints to the diagnosis is loss of smell (5) which many of our patients report losing during the first few days of illness.

Though many patients will recover from their initial symptoms over the course of two to three weeks, for a sizable proportion of patients, their clinical course worsens, with dyspnea setting in typically between the fourth and eighth day of illness, although we have also seen some patients in whom dyspnea first
develops more than 10 days after the onset of symptoms. The onset of dyspnea is the point at which COVID-19 can begin to be discerned from other common illnesses.

Some patients who develop dyspnea progress to critical illness, while others have a stable, persistent course that spontaneously resolves after several days or weeks and, in our clinical experience, can often be safely managed at home. We have found these first days after the onset of dyspnea to be critical for monitoring patients frequently by televisits or in-person evaluations. The most useful factor to monitor is oxygen saturation which often drops precipitously with exertion, even in some previously healthy patients. Similar to published observations, several clinical factors appear to predict clinical worsening in our experience, including: older age, diabetes, cardiovascular disease, obesity and hypertension.(6) Having immigrated from Central America and living in close quarters with multiple family members or different families have been particularly important risk factor for disease progression in our patients.

Distinguishing COVID-19 from other serious, treatable conditions is essential. Community acquired pneumonia, especially with atypical organisms such as Legionella, may present quite similarly to COVID-19. (7) There may be some clues, however, that can assist clinicians in distinguishing the two diagnoses. The classic progression of Legionella pneumonia initially begins with fever and fatigue, followed by cough shortly thereafter – dyspnea would only be expected in cases in which the pneumonia progressed to become more severe. In contrast, in patients with COVID-19 we often see the appearance of cough and fever at the onset with dyspnea occurring a few days later, sometimes even after the fever has abated.

Post-viral pneumonia also has many similarities to COVID-19, but might be distinguishable in some cases by a careful history. Cough and fatigue may be the initial presentation in both, but the next stage is different. While increasing fever and productive cough might be symptoms of post-viral pneumonia, in COVID-19 we typically note worsening dyspnea without productive cough.

Similarly, during the initial days of infection, both influenza and COVID-19 may have identical presentations, however, the progression of the two infections diverges. In uncomplicated influenza, it would be unusual to develop the onset of dyspnea 4 to 8 days after symptoms began. While patients with influenza may develop mild dyspnea, we would expect the dyspnea to improve gradually over the following days or weeks with an uncomplicated influenza infection. In addition, patients with rare viral pneumonia from influenza tend to deteriorate rapidly within the first 2 to 3 days of infection, unlike patients with COVID-19 who do not tend to deteriorate until later in their course of illness.

COVID-19 can also present similarly to Streptococcal pharyngitis, viral sinusitis, acute pericarditis and other common infections, but in each case, the key distinction is the development of dyspnea several days after the onset of infection, even as the other symptoms may be improving.

Given the extensive media attention regarding the serious consequences of COVID-19, there is an understandably high level of anxiety in the community. One common cause of shortness of breath in our clinic has been anxiety combined with viral-type symptoms. Key aspects of anxiety-induced shortness of breath that have helped us distinguish anxiety-induced dyspnea from SARS-CoV-2-induced dyspnea is the onset: with anxiety, onset is often immediately after the first symptoms of infection while with SARS-CoV-2 dyspnea occurs several days after the initial symptoms begin. The description of dyspnea is often helpful as well. In our patients with COVID-related anxiety, the dyspnea tends to occur at rest or when trying to fall asleep but does not become more pronounced when participating in daily activities. Patients with COVID-related anxiety often describe the sensation of not being able to get enough air into

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their lungs, while with SARS-CoV-2 infection dyspnea is consistently worse with exertion. While dizziness might occur in both conditions, it too is more likely to be present at rest with anxiety and with exertion in COVID-19 disease. When a pulse oximeter is available, a normal oxygen saturation with ambulation helps confirm one’s clinical suspicion of anxiety-related shortness of breath.

Since current treatment options for COVID-19 disease are limited, we pay particular attention to identifying treatable etiologies of dyspnea including exacerbations of underlying pulmonary and cardiovascular disease and treat the exacerbation as we would have prior to the pandemic.

The typical COVID-19 pattern of a nonspecific viral syndrome – often involving the respiratory system but not infrequently the gastrointestinal system – followed by onset of dyspnea several days later, particularly with precipitous drops in oxygen saturation, are helpful keys to distinguishing COVID-19 from other similar conditions. A nuanced understanding of the typical presentation and natural history of COVID-19 in the ambulatory setting can help determine the appropriate timing of follow-up – patients who have begun to develop dyspnea should be followed closely in the following 72 hours for evidence of worsening dyspnea particularly with exertion – and permit clinicians to more easily distinguish COVID-19 from other common and treatable illnesses.

References


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