



Episode 137 COVID-19 Screening, Diagnosis & Management

With Dr. Andrew Morris & Howard Ovens

Prepared by Anton Helman, March 2020

Quick tips on managing yourself and your team during the COVID -19 outbreak with Howard Ovens

- **Communication amongst your ED group** is crucial which can be augmented using available apps such as WhatsApp, Slack etc.
- Decide on **reliable sources of information** personally and amongst your group as there is an overwhelming amount of both reliable and unreliable information being disseminated
- **Risk to health care workers may be overstated**, and in many cases of “superspreader” events there were violations of personal protection guidelines, highlighting the importance of complying with guidelines
- **Pace yourself** – plan for rest, regular exercise, healthy food, sleep and maintain meditation if you are skilled

- **Contributing in a constructive way to your ED group** and your community may help alleviate anxiety around COVID-19

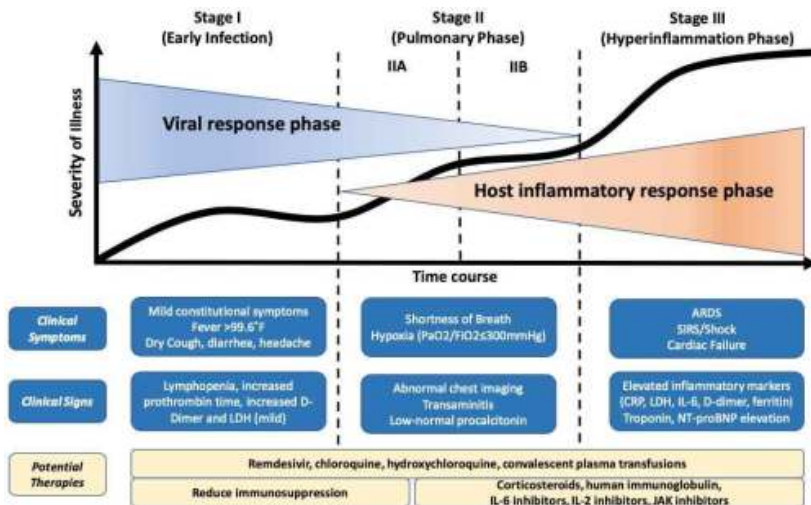
Clinical Presentation and natural history of COVID-19

There is much **overlap in the presentation** of COVID-19 with influenza, the common cold and bacterial pneumonia.

The typical triad includes dry/nonproductive cough, fever and shortness of breath, and most patients will have either fever, cough or both. However up to 20% of patients may have sore throat, nasal congestion or headache, and they may develop sputum production and others may experience antecedent gastrointestinal symptoms such as nausea/vomiting and diarrhea in 3-10% of cases. Fever is present in only 44% of patients at the time of admission. Most patients present within the first week, with a **median incubation period of 4-5 days** following exposure, with some cases having an incubation period of 14 days, or rarely longer.

Older patients and those with chronic medical conditions may be at higher risk for severe illness, however most cases are in people 30-69 years of age.

A small minority of patients develop septic shock and/or ARDS, which often occurs precipitously around 1 week after symptom onset. Therefore, patients who are discharged from the ED should be instructed to return for worsening shortness of breath or lethargy. Possible **risk factors for progressing to severe illness** may include older age and co-morbidities (lung disease, cancer, heart failure, cerebrovascular disease, renal disease, liver disease, diabetes, immunocompromising conditions).



From PulmCrit

The only sign or symptom that seems to have any **predictive value for severe disease** is shortness of breath.

Influenza co-infection is possible, however the incidence of influenza is decreasing and is likely to decrease further with wide spread social distancing. In one study 22% of 562 patients were positive for other viruses such as influenza, and a small minority of patients have been reported to develop bacterial pneumonia. However, most patients who are admitted to hospital with presumed COVID-19 are being given antibiotics on speculation, which may mask or prevent a secondary bacterial pneumonia. The virus is present in respiratory specimens up to 22 days after illness onset and in stool specimens up to 30 days after illness onset and the WHO emphasizes isolation for 2 weeks after symptoms stop.

While transmission of virus is thought to occur via droplet from coughing, sneezing and talking, **asymptomatic or subclinical infection** based on

positive swab results have been reported, which is one of the reasons that community spread has occurred so readily.

Reinfection with COVID-19 is unlikely as the virus has little diversity globally and most patients have a robust immune response to it suggesting that there would be immunity once infected. However if the virus mutates like the influenza virus does than any further immunity would at best be partial.

Screening for COVID-19

Given the nonspecific presentation and current epidemiology (community spread, more common than all other respiratory illnesses), all patients who present with a respiratory illness should be presumed to have COVID-19 until proven otherwise.

There has been no country that has been able to contain COVID-19, and so attention has turned to “flattening the curve” or slowing down the spread of COVID-19 by widespread screening early in the illness course, social distancing and isolating patients with any symptoms of COVID-19. However, few jurisdictions in North America and Europe have the infrastructure for mass screening and resources (testing kits, staff to perform the screening, contact tracing abilities, and lab capacity) and have been overwhelmed.

At present there is not enough epidemiological data to determine the **accuracy/predictive value of the PCR viral swab for COVID-19**, however the specificity is thought to be high while the sensitivity is likely <90%. While testing can certainly miss COVID-19 as a result of the relatively poor sensitivity of the PCR viral swab, most of these patients will have a clinical picture that is consistent with COVID-19 and will be presumed to have the diagnosis even with a negative swab result.

North York General criteria for NP swab for COVID-19 screening as of March 20, 2020

**Note: indications for screening may vary by jurisdiction; this is simply an example for educational purposes*

Outpatients: Fever **OR** mild symptoms of URI **AND** any of:

- - High risk of deterioration (elderly, immunocompromised, multiple comorbidities)
 - Those who work in vulnerable settings (prisons, homeless shelter, retirement home)
 - Those who work within at-risk settings (i.e. hospitals, long-term care, paramedics)

Travel is no longer a criterion for swabbing

Inpatients: URI symptoms **AND** being admitted to internal medicine service

Laboratory clues to COVID-19

Lymphocytopenia is present in >80% in patients and is probably the most useful lab test in distinguishing COVID-19 from other causes of respiratory infection.

Nonspecific lab abnormalities include elevated LDH, AST, ALT, elevated D-dimer, abnormal WBC.

Troponin and CRP may be a predictor of mortality and severe illness, and should be considered in patients who are going to be admitted.

While **influenza co-infection** has been reported with COVID-19, our expert recommends leaving the decision to test for influenza to the inpatient team, your local infection control specialists or public health authorities. There may be a role for testing for influenza for all ICU patients admitted with suspected COVID-19, as some patients may benefit from neuraminidase inhibitors.

Imaging in COVID-19

CXR

The typical CXR findings are a bilateral interstitial pattern/ground glass opacities, with isolated focal infiltrate making the diagnosis less likely, however CXR may be normal early in the disease course, so a normal x-ray does not rule out the diagnosis.

CT

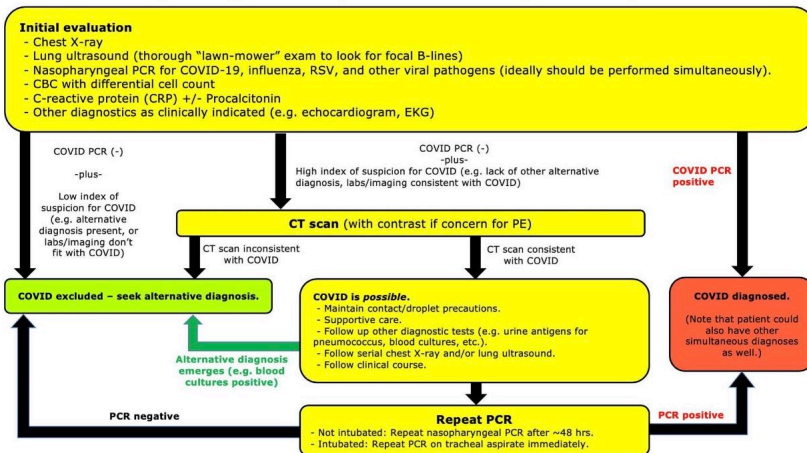
CT is more accurate than CXR and has been used as a screening tool, however our expert does not recommend screening with CT unless swabs are unavailable or lab reporting is delayed, in patients who are ill enough to be admitted to hospital.

Lung POCUS

POCUS findings correlate well with CT findings for COVID-19 and there have been reports that lung ultrasound may be helpful for patients with a high clinical suspicion of COVID-19 but negative PCR screening if they demonstrate typical lung ultrasound findings for COVID-19. For emergency providers with excellent POCUS skills and poor access to CT it is not unreasonable to use POCUS to aid in the diagnosis and rule out other acute respiratory illnesses, however POCUS should not be used a screening test for COVID-19 at present.

Clinical diagnosis of COVID-19 is cough and/or fever, lymphocytopenia and bilateral ground glass opacities on chest x-ray.

Possible diagnostic approach to ill patient admitted to hospital with suspected COVID-19



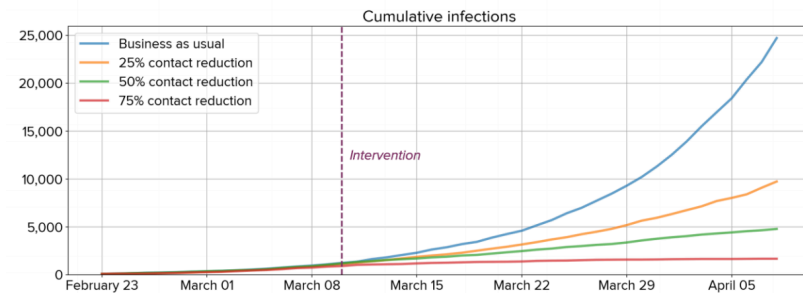
Potential strategy for ill patients with suspected COVID-19. This algorithm doesn't address exactly when to initially suspect COVID-19, which will become increasingly challenging as community spread occurs.

-The Internet Book of Critical Care, by @PulmCrit

COVID spread prevention strategies

Social distancing does not stop all new cases overnight, but it greatly decreases case counts and fatalities over time

If everyone decreased their daily contacts by 25%, we would expect to see a 50% decrease in the cumulative number of cases over the next month (Klein et al., 2020-03-13).



How long is the COVID outbreak likely to last?

It is our expert's opinion that the earliest we will have an **effective vaccine for COVID-19** will be June 2021. The degree of effectiveness of this vaccine will partially determine how long the COVID outbreak will last. Other factors include whether or not the virus mutates, implementation and compliance of social distancing and isolating measures, the number and size of second peak outbreaks, and strategies/timing of re-opening of country borders.

Disposition for COVID-19

The vast majority of patients can be safely discharged home. Some have suggested the **Pneumonia Severity Index** to help in disposition decisions for COVID.

Management of COVID-19

Currently **there is no specific targeted evidence-based treatment or vaccine for Covid-19**. The approach to this disease is to control the source of infection; use of personal protection and precaution to reduce the risk of transmission; and early isolation and supportive treatments for affected patients.

Drugs for COVID-19 that have shown *in vitro* benefit

- Chloroquine
- Hydroxychloroquine
- Lopinavir/ritonavir (Kaletra)
- Remdesivir
- Tocilizumab

COVID-19 drug studies

Lopinavir/ritonavir (Kaletra)

NEJM Lopinavir/ritonavir RCT of 199 patients showed no significant difference in time to clinical improvement, with a trend to mortality benefit as a secondary endpoint but the trial was stopped too early to determine a statistically significant mortality benefit. At present there is no convincing evidence for benefit or harm from Lopinavir/ritonavir in COVID-19 patients.

Hydroxychloroquine plus Azithromycin

A prospective, observational study of 36 hospitalized patients with confirmed COVID-19 showed that after 6 days of treatment, 70% of patients who received hydroxychloroquine plus azithromycin were

virologically cured compared to 12.5% in control group. There were no patient oriented outcomes.

Note that azithromycin and chloroquine are QTc prolonging.

Hydroxychloroquine oral dosing: 400mg BID x1d, then 200mg po BID x4d

Chloroquine

A non-peer reviewed study from China compared 100 patients given chloroquine to controls and found greater inhibition of pneumonia, improved lung imaging findings, and shortening of disease course.

If the decision to give antibiotics is made, usually based on imaging findings, Azithromycin has been suggested as the antibiotic of choice due to its antibacterial and immunomodulatory properties.

ACEi/ARBs and COVID-19

While there is theoretical reason to discontinue ACEi or ARBs in patients with COVID-19 because the virus has ACEi binding receptors, patients taking ACEi or ARBs who contract COVID-19 should continue treatment as per European, Canadian, and the United States cardiovascular societies.

Ibuprofen and COVID-19

There is no evidence that ibuprofen or other NSAIS worsens the clinical course of COVID-19. The WHO does *not* recommend against the use of ibuprofen to treat COVID-19 symptoms.

COVID-19 in Older Patients

- Older patients, particularly those with multiple comorbid illnesses, have the highest mortality rate with COVID-19.

- CDC guidelines recommend that symptomatic (fever or cough) older adults and those with chronic medical conditions or who are immunosuppressed should have a low threshold for testing for COVID-19.
- During a shortage of testing kits and their reagents, criteria should be followed to ensure those who are at highest risk receive testing.
- Place older patients with non-respiratory symptoms in a separate area of the ED, away from those with suspected respiratory infections.
- Be sure to communicate slowly and clearly for those with sensory or cognitive limitations. Patients will no longer be able to read lips and clinicians and caregivers wearing masks may be disorienting for those with dementia and other cognitive impairment.
- Work with their Area Agency on Aging (AAA) and/or Department of Public Health (DPH) to provide community resources for home delivered groceries and medications. Social worker assistance for these cases will be very helpful.

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