



COVID-19 Update

Key Article(s)

- Yee J, Unger L, Zdravetz F, et al. **Novel coronavirus 2019 (COVID-19): Emergence and implications for emergency care.** *Journal of the Amer College of Emerg Phys.* [epub ahead of print]
- Wu Z, McGoogan JM. Characteristics of and Important Lessons from the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases from the Chinese Center for Disease Control and Prevention. *JAMA.* 2020;

Background

- In December 2019 a novel coronavirus (now named COVID-19) was identified as responsible for a cluster of pneumonia cases in Wuhan, China
- As of March 2020, over 50 countries have identified patients who have tested (+) for COVID-19, with over 90,000 identified cases and 3000 deaths to date.
- The rapid, world-wide spread of COVID-19 has led many leaders to suggest we may experience a global pandemic, which has left patients and healthcare workers with many questions.
- As the discussion regarding COVID-19 continues to grow, it is important for clinicians to not only prepare locally, but to also review standards for prevention.

Coronavirus Family

- COVID-19 belongs to the *beta* coronavirus family, similar to SARS and MERS, but has a significantly lower case-fatality rate of 3.1%
- In comparison to seasonal influenza globally, coronaviruses represent a smaller burden of disease, and fall well short of the 1918 Influenza pandemic (500 million cases, 10% case fatality rate!).
- To put the current COVID-19 outbreak to scale, seasonal influenza accounts for about 7.7 million annual cases with a 0.05% case fatality rate.
- **Transmission:** COVID-19 is believed to have started as a zoonotic infection (prime suspect animal: the pangolin or bat) with mutation to allow Human-to-human transmission
 - Respiratory droplets transmission; thought mostly to occur in symptomatic patients.
 - Asymptomatic transmission has been reported but not confirmed. A critical question that remains is can COVID-19 be passed along during the incubation period or by patients with mild disease?

Clinical Course

- Of known and reported cases, COVID-19 has the following characteristics
 - Average incubation is estimated to be about 5 days
 - Early symptoms include: fever (83-98%), cough (76-82%), and shortness of breath; less common sx include myalgias, rhinorrhea, headache
 - Approximately 10% of patients had GI sx in the first week
 - 80% of cases are mild, 15% are severe (defined as an SpO₂ < 93%)
 - 5% of patients presented with critical disease: requiring NIV/MV, respiratory failure, vasodilatory shock, or requiring renal replacement therapy
- Mainland China patient data: Approximately 5% of patients had complications such as ARDS, AKI, and septic shock – but it is unclear when patients presented along their disease course
- 80% of COVID-19 deaths were in patients > 60 years' old
- >75% of COVID-19 deaths had comorbid medical conditions such as HTN, DM, or CAD

Diagnosis

- A detailed travel history is critical, and current CDC recommendations suggest that anyone who has traveled to China, Iran, Italy, Japan, South Korea or has had close contact with a person with confirmed COVID-19 in the past 14 days should be considered a person under investigation (PUI)
- Patients suspected of possible COVID-19 infection should be given a facemask, isolated in a negative pressure room, and healthcare workers should care for patients using appropriate personal protective equipment
- PPE
 - Contact/droplet precautions are needed for non-aerosol-producing procedures
 - For aerosol generating procedures: N-95 mask or respirator, goggles or face shield, gloves, coverall/long-sleeved gown, and negative pressure rooming
 - Handwashing
 - IMPORTANT: Particularly important as a large number of COVID-19 patients in Wuhan, China are believed to have been healthcare associated infections (63%).!
- If your hospital has not set up a reporting mechanism, the CDC website is very helpful for more information regarding reporting (Links will be in references section at the bottom)
- Labs: Look for end-organ injury 2/2 sepsis, check CBC, BMP, coags, resp viral panel, blood cultures.
 - Note: A high incidence of mild troponin elevation has been reported, unclear if this is secondary to stress cardiomyopathy or viral myocarditis

Treatment

- **Hypoxemia is primary problem to address, along with supporting any additional organ dysfunctions**
- **Primary question:** Is high flow nasal cannula or non-invasive ventilation a reasonable therapeutic strategy?
 - Respiratory support can begin with NIV, but **WHO interim guidance recommends intubation quickly if any signs of NIV/HFNC failure**
 - **Prolonged NIV failure associated with high fatality rate**
 - Specific signs to identify early failure of non-invasive respiratory support strategies:
 - Refractory hypoxemia (P/F < 100)
 - Tidal volumes > 9mL/kg/IBW while on BiPAP (indicating large amount of dead space disease, progression to ARDS)
 - Increased work of breathing or persistent respiratory distress
- Other supportive treatments for severe cases
 - Lung recruitment maneuver in ARDS (PEEP set to 30 mmHg for 30 seconds, along with an end-expiratory hold)
 - Neuromuscular blockade if P/F < 150 and evidence of ventilator dyssynchrony
 - Proning if necessary, in ICU
 - Rapid consideration for transfer to tertiary care center or ECMO capable center
- IV fluids: Conservative therapy if no evidence of hypovolemic shock
- Abx: Diagnosis will often be delayed 2/2 sampling results, should empirically cover all patients with antibiotics to cover for possible community acquired or hospital associated pneumonia
- **Steroids: Highly controversial**
 - Widely used in China, but significant concern for prolonged viral shedding (up to 2 months!) with steroid therapy, which can lead to increased chance of secondary infection, particularly fungal infection
 - **A systematic review of observational studies of corticosteroids administered to patients with SARS reported no survival benefit and possible harms, so similar recommendations are being made for COVID-19**
 - Unclear if short-term therapy beneficial
- Disposition:
 - If in ED and airborne isolation room not available, early transfer recommended
 - If discharging a PUI home, should be done with local public health authority discussion
 - Risk/benefit of discharge should consider discharge may be inappropriate for patients who are unable to adhere to recommendations, return precautions, self-monitoring, or those with inadequate housing

Summary

- COVID-19 is a novel coronavirus similar to SARS & MERS that is rapidly being identified around the world
- Important to take a detailed travel history when meeting patients with respiratory infections presenting to the ED

- Most COVID-19 (+) patients present with mild symptoms, however progression to respiratory failure and shock occurs in 5-15% of patients.
- In addition to supportive care, timely intervention including mechanical ventilation should be made quickly if patients are failing HFNC or NIV/PPV
- Important to protect healthcare workers with proper PPE and isolation precautions to prevent hospital acquired transmission.

Additional resources

COVID-19 CDC assessment flowchart: https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-criteria.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fhcp%2Fidentify-assess-flowchart.html

COVID-19 CDC Interim Clinical Guidance: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html>