

COVID-19 Prevention and Control Recommendations for the ICU

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Editor's Note: We are planning on presenting a case of COVID-19 from Osborn as our case of the month for April. The authors felt we should publish preliminary recommendations now early in the COVID-19 pandemic. The recommendations are not necessarily evidence-based but are based on recent experience and published experience with previous coronavirus outbreaks such as SARS.

Background:

- COVID-19 is likely somewhat more infectious than influenza (R value in 2-3 range), and can be transmitted by asymptomatic/presymptomatic persons.
- COVID-19 is already in the community and likely being spread from person to person, Therefore, not all COVID-19 patients will present with a recognized exposure history. Furthermore, fever and pneumonia are not universally present.
- As of this writing, >3,300 healthcare workers have been confirmed infected globally with 6 deaths.
- Testing is currently extremely limited in the US with only a minority of potential cases having been tested at this time. This will likely improve over the next few days to weeks. True incidence likely much higher than reported rates of "confirmed COVID-19".
- About 15% of patients with confirmed COVID-19 have severe disease and 5% require ICU level care. Mortality rates of approximately 1-2% may be confounded by undertesting, but is currently more than 10 times higher than that of influenza (approx. mortality of 0.05-0.1%) (1).

Infectious disease control issues in the ICU. We recommend droplet, contact and standard precautions when seeing any patient presenting with symptoms of acute upper or lower respiratory tract infection of unknown etiology, regardless whether they meet full CDC criteria for COVID-19 testing.

Studies during the SARS epidemic showed that intubation, bag-mask ventilation, non-invasive ventilation and tracheostomy procedures were all associated with increased transmission of SARS to healthcare workers (2).

Code arrest. We recommend aerosol, contact and standard precautions and eye protection for all code team members *for all codes* - regardless of whether COVID-19 is suspected. There is no time in a code to determine the likelihood of the patient having COVID-19, and bag-masking and intubation will aerosolize the patient's respiratory

secretions. A HEPA filter should be placed between the patient and the bag mask to reduce aerosolization of viral particles into the atmosphere.

Elective or semi-elective endotracheal intubation of patients with possible or confirmed COVID-19. If available, powered air-purifying respirators (PAPR) using P100 HEPA filters (filter >99.97% of 0.3 μm particles) should be considered over N-95 (filter 95% of 5 μm particles) masks during this high-risk procedure based on prior reports of SARS CoV-1 transmission to healthcare workers wearing N95 masks (3). PAPR protects the entire head and neck of the HCW, but requires additional training on donning/duffing.

If unable to wear PAPR, we recommend N95 masks, gowns and gloves, with goggles instead of open face shielded masks. Aerosolized particles are more likely to pass around shields into eyes during these high-risk procedures. We also recommend hats and foot protection.

The smallest number of personal required to safely perform the intubation should be present in the room. Fiberoptic laryngoscopy may be preferred over direct laryngoscopy to reduce exposure to aerosolized particles. Once intubated, a HEPA filter should be placed on the exhalational limb of the ventilator.

Non-invasive ventilation and high-flow nasal oxygen. Non-invasive ventilation and high-flow nasal oxygen likely increase the infectivity of COVID-19 by aerosolizing the patient's respiratory secretions. Consideration should be given to early intubation in patients under investigation or confirmed for COVID-19 (4).

Visitors should not be allowed inside the rooms of such patients except under extreme circumstances and with one-on-one supervision to assure proper use of PPE and handwashing.

Furthermore, we think it is prudent to employ PPE in the rooms of *all* patients receiving these therapies, since patients with COVID-19 may present atypically (as in the Osborn case). The doors of their rooms should be kept closed, unnecessary traffic in the room reduced, and droplet contact and standard PPE considered, even in patients in whom COVID-19 is not suspected. (This approach has the downside of consuming PPE that might later be in short supply, but has the upside of preserving healthcare workers who also might later be in short supply).

References

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