

Lessons Learned from the Front Line of the COVID-19 Outbreak in Northern Italy: An Emergency Physician's Perspective:

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- Prepare to initially receive patients with upper airway symptoms, followed in the next days by patients with persistent fever, and finally, patients with interstitial pneumonia. The proportion of patients needing admission increases day by day. As of March 10, 2020, up to 60%-70% of patients presenting to the ED with suspected COVID-19 infection needed to be admitted, primarily for hypoxia.
- Be ready to adjust the spaces and the resources to the flow of incoming patients many times during the day, dividing “clean” flow from “dirty” flow. It is fundamental to have leadership personnel on the floor to help manage the flow in the ED.
- In the first days, the critically ill patients will be mostly older than 65 with comorbidities, followed by younger patients in the days/weeks after. Do not exhaust all of your resources with the first patients. Patients will need to stay in the ICU for weeks.
- Patients come in waves, usually in late afternoon. For every 100 patients coming to the ED, expect to have 5 with severe ARDS, 10-20 with mild/moderate ARDS, and 40 patients needing oxygen to treat hypoxia.
- Do not rely on a negative nasal swab test. If a patient looks like they have COVID-19 pneumonia, they usually end up having it. Treat them as COVID-19 pneumonia, with isolation, and repeat the testing in 3 days. Every patient presenting with fever is a potential COVID-19 infection, even if they do not have respiratory symptoms.
- Prepare in advance to have 10% of staff becoming ill. Personal protection is hard to maintain during long shifts in a busy ED, but it is feasible, and constant vigilance is mandatory.
- Most admitted patients on respiratory support are PEEP responders. Noninvasive ventilation is a powerful tool to buy some time until an ICU bed becomes available. In Bergamo, our outbreak protocol is to start with helmet CPAP on all patients who remain hypoxic on maximal oxygen therapy and admit them to regular wards until an ICU bed is available. Intubation and invasive mechanical ventilation in the ED are reserved for patients not responsive to NIV. In our experience, mild to moderate ARDS responds well to helmet CPAP/NIV for the first days. Expect severe ARDS to be responsive to NIV for only a short period of time.
- In large health systems, strategize to designate one hospital to cohort COVID-19-positive patients while keeping the other hospitals “clean.”
- Lung ultrasound is very helpful in evaluating patients on arrival. It is more sensitive than chest x-ray, with a diffuse B-line pattern correlating to good response to PEEP.
- Tell all the patients with fever being sent home to return immediately if respiratory symptoms develop or worsen. Check home SpO₂ if possible. In our experience, patients do not feel dyspneic until they become profoundly hypoxic.
- Prepare psychological support for the staff early. You will need it.