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One Emergency Physician's Cheat Sheet to COVID-19

Dr. Birnholz:

Coming to you from the ReachMD Studios, this is *COVID-19: On the Frontlines*. I'm Dr. Matt Birnholz.

On this episode, we're taking an unusual track. It's neither thoroughly vetted nor scientifically fact checked. In short, it's a journalistic departure. But it's also profound in its simplicity and its directness, because it's what one person believes to know in a time and setting where so little is known at all. What I'm going to share with you from an anonymous online contributor are the outlines of a clinical picture of COVID-19, with a snapshot of takeaways from the emergency department of a small community hospital that's already overwhelmed. The writer freely admits to not being a clinical researcher, infectious disease specialist, or pulmonary critical care physician. Rather, this is a report of some clinical pearls picked up thus far from one corner of the pandemic, intended to help other colleagues hit the ground running as this person has had to do. If the clinical patterns described here match what you're seeing, or if they don't, let us know either way. We're listening, and we'll share your account, too.

This writer claims to be an ER doc in New Orleans, where the staff of one hospital have now seen several hundred COVID-19 patients. Here's what's been learned, in their own words:

The Clinical course is predictable.
2 to 11 days after exposure (day 5 on average), flu-like symptoms start. Common are fever, headache, dry cough, myalgias (often back pain), nausea without vomiting, abdominal discomfort with some diarrhea, loss of smell, anorexia, fatigue.

Day 5 of symptoms- increased shortness of breath, and bilateral viral pneumonia from direct viral damage to lung parenchyma.

Day 10 - Cytokine storm leading to acute ARDS and multiorgan failure. You can literally watch it happen in a matter of hours.

81% mild symptoms, 14% severe symptoms requiring hospitalization, 5% critical.

Patient presentation is varied. Patients are coming in hypoxic (even at 75% Osats) without dyspnea. I have seen COVID patients present with encephalopathy, renal failure from dehydration, DKA. I have seen the bilateral interstitial pneumonia on the xray of the asymptomatic shoulder dislocation or on the CT's of the poly-trauma patient with no respiratory symptoms. Essentially, if they are in my ER, they have it. Seen three positive flu swabs in 2 weeks and all three had COVID 19 as well. Somehow this virus has told all other disease processes to get out of town.

China reported 15% cardiac involvement. I have seen COVID-19 patients present with myocarditis, pericarditis, new onset CHF and new onset atrial fibrillation. I still order a troponin, but no cardiologist will treat no matter what the number in a suspected COVID-19 patient. Even our non-COVID-19 STEMIs at all of our facilities are getting TPA in the ED and rescue PCI at 60 minutes only if TPA fails.

Some diagnostic observations:
Chest X-ray shows bilateral interstitial pneumonia, anecdotally, starting most often in the right lower lung, so bilateral on CXR is not required. The hypoxia does not correlate with the CXR findings. Their lungs do not sound bad. Keep your stethoscope in your pocket and evaluate with your eyes and pulse ox.

For, Labs: WBC counts are low, Lymphocytes low, platelets lower then their normal, Procalcitonin normal in 95%. CRP and Ferritin are elevated most often. CPK, D-Dimer, LDH, Alk Phos, AST and ALT are commonly elevated.
Notice D-Dimer- I would be very careful about CT PET in these patients for their hypoxia. The patients receiving IV contrast are going into renal failure and go on the vent sooner.

Basically, if you have a bilateral pneumonia with normal to low white blood cell count, lymphopenia, normal procalcitonin, elevated CRP and ferritin- you have COVID-19 and do not need a nasal swab to tell you that.

A ratio of absolute neutrophil count to absolute lymphocyte count greater than 3.5 may be the highest predictor of poor outcome. The UK is automatically intubating these patients for expected outcomes regardless of their clinical presentation.

An elevated Interleukin-6 is an indicator of their cytokine storm. If this is elevated, watch these patients closely with both eyes.

Other factors that appear to be predictive of poor outcomes are thrombocytopenia and LFTs 5x the upper limit of normal.

On Disposition, the writer adds the following:
I had never discharged multifocal pneumonia before. Now I personally do it 12-15 times a shift. 2 weeks ago we were admitting anyone who needed supplemental oxygen. Now we are discharging with oxygen if the patient is comfortable and oxygenating above 92% on nasal cannula. We have contracted with a company that sends a paramedic to their home twice daily to check on them and record a pulse ox. We know many of these patients will bounce back but if it saves a bed for a day we've accomplished something. Obviously we are fearful some won't make it back.

The writer turns to therapies:

Treatment is supportive. Plaquenil doesn't appear to be a savior of any kind in our patient population. Theoretically, it may have some prophylactic properties but so far it is difficult to see the benefit to our hospitalized patients, but we are using it and the studies will tell. With Plaquenil's potential QT prolongation and liver toxic effects (both particularly problematic in COVID-19 patients), I am no longer selectively prescribing this medication.

We are also using Azithromycin, but are intermittently running out of IV.

D o *not* give these patient's standard sepsis fluid resuscitation. Be very judicious with the fluids as it hastens their respiratory decompensation. Outside the DKA and renal failure dehydration, leave them dry.

Proning vented patients significantly helps oxygenation. Even self proning the ones on nasal cannula helps.

Vent settings: Usual ARDS stuff. Low volume, permissive hypercapnia, etc. Except for Peep of 5 will not do. Start at 14 and you may go up to 25 if needed.

Do *not* use Bipap- it does not work well and is a significant exposure risk with high levels of aerosolized virus to you and your staff. Even after a cough or sneeze this virus can aerosolize up to 3 hours.

The same goes for nebulizer treatments. Use MDI. You can give 8-10 puffs at one time of an albuterol MDI. Use only if wheezing which isn't often with covid 19. If you have to give a nebulizer must be in a negative pressure room; and if you can, instruct the patient on how to start it after you leave the room.

Do not use steroids, it makes this worse. Push out to your urgent cares to stop their usual practice of steroid shots for their URI or bronchitis.

We are currently out of Versed, Fentanyl, and intermittently Propofol. Get the dosing of Precedex and Nimbex back in your heads.

The writer concludes:

I use the best PPE I have. I wear a MaxAir PAPR the entire shift. I do not take it off to eat or drink during that shift. I undress in the

garage and go straight to the shower. My wife and kids fled to her parents. The stress and exposure at work coupled with the isolation at home is trying. But everyone is going through something right now. Everyone is scared; patients and employees. But we are the leaders of that emergency room. Be nice to your nurses and staff. Show by example how to tackle this crisis head on. Good luck to us all.

For ReachMD, this is *COVID-19: On the Frontlines*. We want to hear from you. Add your perspectives toward the fight against this global pandemic by visiting us at ReachMD.com. Thank you for listening.