

Take 3 – Practical Practice Pointers[®] March 23, 2020 Edition
More COVID-19 Information Edition:
Testing FAQs, Virus Stability, Use of PPE, Use of ACE-I and ARBs

From the CDC and the VDH

1) Top “Testing for COVID-19” Questions

From a March 16 JAMA livestream interview with Jay Butler, MD, who is deputy director for infectious diseases at the CDC.

What test is being used to identify COVID-19? In the US, the most common and widely available test is the RT-polymerase chain reaction (rRT-PCR), which over the past few weeks has become available at public health labs across the country. More recently, there’s been a number of commercial labs that have come online to be able to do the testing and a number of academic centers are now able to run FDA-approved testing using slightly different PCR platforms.

How accurate is the test? PCR is the “gold standard” for testing COVID-19, however, data on test sensitivity is limited.

At what point does a person with coronavirus test positive? This is presently unknown. The assumption is that a patient who tests positive is more likely to be infectious and data suggest the level of infectiousness is greatest after the onset of symptoms. There is at least some anecdotal reports that suggest that transmission could occur before onset of symptoms, but the data is still very limited.

Who should get tested? The focus should be those who are symptomatic with evidence of respiratory tract infection and particularly on people who may be at higher risk of more severe illness. People who are concerned about the virus and want a test are not the target.

Do we have an adequate supply of tests in the US? The CDC has addressed supply concerns by broadening the number of PCR platforms that can be used to run COVID-19 analyses. Expansion of these platforms has enabled further testing options and allowed consumer labs and academic centers to contribute to testing.

When can people who test positive go back to work? The CDC is still researching that question and reviewing the data. The current recommendation is that a patient who tests positive is considered clear to return to work after two negative tests at least 24 hours apart, following the resolution of symptoms. The CDC has not yet made an official recommendation on an exact time frame, but the CDC is considering a 14-day minimum of isolation. **NOTE:** The Virginia Department of Health is making the following interim recommendations for suspected or documented cases given present limitations of testing:

- If pt COVID suspect but not tested, recommendations are to isolate until 72 hrs after resolution of fever AND ALL OTHER SYMPTOMS
- If pt COVID POS, recommendations are to isolate until 72 hrs after resolution of fever AND ALL OTHER SYMPTOMS, or 2 consecutive negative tests (24 hrs apart)

What do we know about immunity? Can patients get re-infected? Long-term immunity after exposure and infection is virtually unknown. Investigators know those with COVID-19 have an antibody response, but whether that is protective or not, is unclear. In regard to older coronaviruses, such as those that cause colds, patients generally develop an antibody response and may have a period of immunity, but that immunity eventually wanes and reinfection can occur.

Mark's Comments:

It was noted that “These are recommendations that are in-draft.... I want to be clear, I’m floating concepts out there that people can consider. ... I recognize as a former infection control medical director at a hospital that sometimes you have to adapt those guidelines based on your local conditions.”

Our learning curve is steep, and we’ll be sure to keep readers updated as we learn more about both testing and “return to work” guidance.

Reference:

JAMA Network Livestream – Corona Virus (COVID-19) Testing. 16 March 2020: [Video](#)

From the Literature

2) Stability of the Coronavirus on Surfaces

New data indicate that the stability of the novel coronavirus, SARS-CoV-2, which causes COVID-19, is similar to that of SARS-CoV-1, which caused the SARS epidemic of 2003 and can remain viable on surfaces for days.

Despite that, transmission of SARS-CoV-2, which causes COVID-19, has quickly outstripped the pace of the 2003 SARS epidemic. The novel coronavirus appears to be spread more through human-to-human transmission in a variety of settings. However, it's not yet known the extent to which asymptomatic or pre-symptomatic individuals spread the new virus through daily routine.

This study tested the SARS-CoV-2 virus on a variety of surfaces for up to 7 days, using humidity values and temperatures designed to mimic a variety of household and hospital situations. The volumes of viral exposures that the team used were consistent with amounts found in the human upper and lower respiratory tracts.

Their findings (with averages) included:

- Plastic: 2-3 days
- Stainless Steel: 2-3 days
- Cardboard: 24 hours
- Copper: 4 hours

The novel coronavirus was most stable on plastic and stainless steel, with some virus remaining viable up to 72 hours. However, by that time the viral load had fallen by about three orders of magnitude, indicating exponential decay.

The authors concluded: "Taken together, our results indicate that ... fomite transmission of HCoV-19 [SARS-CoV-2] are plausible, as the virus can remain viable ... on surfaces up to days."

Mark's Comments:

These kinds of real-world experiments are extremely helpful (and the results, concerning). What is not yet known is how much infectious (viable) virus is needed to initiate infection in another person. Thus, the importance of Pointer 3 about PPE.

Reference:

van Doremalen N et al. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. NEJM Letter to the Editor. Online 17 March 2020. [Link](#)

From the Literature

3) Personal Protective Equipment (PPE) Safety

PPE is designed to protect the skin and mucous membranes from exposure to pathogens. Health care workers who use PPE to guard against contamination with the COVID-19 virus should be guided by these three principles:

- Vulnerable skin and mucous membranes must be protected when wearing PPE, because of the possibility of contact with infected body fluids.
- Repetitive training and demonstrated competency in putting on and removing PPE ensure proficiency in the use of the equipment and is recommended (NOTE: Cannot do this presently due to limited equipment supply, therefore see next bullet).
- A trained observer should always be present when a health care worker is putting on or removing PPE, to identify and immediately address any breaches in protocol. The use of a checklist is recommended to document the correct sequence of steps in putting on or taking off PPE.

Mark's Comments:

The attached PDF document and video at the link below demonstrate a process that will minimize the risk of exposure to infectious material when putting on and removing PPE. Though I learned all this at one point in time, the maxim "if you don't use it, you lose it" certainly applied to me. Given the present stakes, we would all be wise to review. I have not seen a formal "checklist" but the CDC document could function as such.

References:

- CDC – Sequence for putting on and removing PPE (**PDF attached**): [Link](#)
 - Ortega R, et al. Putting on/removing PPE (with **Video**). NEJM March 19, 2015.
NOTE: This video was originally made in response to the Ebola virus outbreak. [Link](#)
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Guidance from Professional Specialty Groups

4) COVID-19 and the Use of ACE-I and ARBs

There is concern about risk of increased severity of disease among COVID-19 susceptible and COVID-19 positive patients receiving RAS Blockers. The SARS-CoV2 (COVID-19) virus uses the angiotensin converting enzyme 2 (ACE2) receptor to enter

cells. Some renin-angiotensin system (RAS) blockers, such as ACE inhibitors, angiotensin receptor blockers (ARBs) and direct renin inhibitors may result in increased ACE2 expression. Therefore, there is potential concern that this may facilitate viral entry into cells and cause a more severe disease course. Countering this argument is some evidence that higher ACE2 expression may be anti-inflammatory through the conversion of angiotensin II to angiotensin 1-7 (Ang1-7) and attenuate the severity of adult respiratory distress syndrome (ARDS).

At this time, there are no clinical or epidemiological data to confirm or dispel these hypotheses based primarily on well-described preclinical studies who are COVID-19 susceptible or COVID-19 positive.

Present recommendations for different clinical groups:

1. **Patients with heart failure and reduced ejection fraction:** Continue current therapy given the known benefits of RAS blockers in this patient population.
2. **Patients with hypertension on RAS Blockers:** There is a lack of data on whether patients taking RAS blockers for hypertension should stop these agents and replace them with medications from a different class. Continue current therapy.
3. **Patients with hypertension on RAS Blockers with suspected COVID-19 infection:** Continue RAS blockers. At this time there is no compelling data to support stopping RAS blockers.
4. **Patients with HFrEF (CHF) and suspected COVID-19 infection:** Continue RAS blockers. Also recommend that these patients should contact their cardiologist and/or primary care physician to discuss.
5. **Patients with confirmed COVID-19 infection:** Consideration should be given to stopping RAS blockers, especially in cases of more severe infection. However, this decision should be individualized and made in consultation with the patient's care team. For critically ill patients with ARDS, acute kidney injury, we recommend discontinuation of RAS blockers.

Mark's Comments:

Given the number of people on these medications and the estimates as to how many people will ultimately become infected with COVID-19, the answer to this question will be critical and the research will be ongoing.

References:

- HFSA/ACC/AHA Statement Addresses Concerns Re: Using RAAS Antagonists in COVID-19. March 17, 2020. [Link](#)
- Statement of the European Society of Hypertension (ESH) on hypertension, Renin Angiotensin System blockers and COVID-19. March 12, 2020. [Link](#)

Feel free to forward Take 3 to your colleagues. Glad to add them to the distribution list.

Mark and John

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