2019-nCoV (Coronavirus):
Recommendations and Guidance for Organ Donor Testing

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The AST's Infectious Disease Community of Practice has received queries from transplant and donation colleagues regarding the novel coronavirus (2019-nCoV). The following FAQs were developed with input of members from both the organ donation and transplantation communities to relay information on the current state of knowledge. This document is subject to change as more information becomes available.

Also see UNOS information link: https://unos.org/covid/

SARS CoV-2 transmission and implication for Healthcare Centers

Infection is acquired from someone who is shedding virus. Person-to-person transmission was recognized early in the pandemic during close exposure (<6 feet) to a person infected with COVID-19, primarily via respiratory droplets produced when the infected person coughs or sneezes. Most frequently, transmission is presumed to be from symptomatic individuals with COVID-19 via droplet spread. Shedding from asymptomatic individuals has also led to transmission of infection. In addition, indirect transmission from fomites with infected particles is presumed to occur. While stool has tested positive for SARS-CoV-2 in some cases by nucleic acid testing (NAT) including polymerase chain reaction (PCR), it is not known whether this is replicative virus. The incubation period is usually between 2-14 days in the general population although longer incubations have been documented (Bai Y et al JAMA 2020).

Donor Screening in the Era of COVID-19

The epidemiology of SARS-CoV-2 is changing over time and the knowledge base is rapidly expanding. The recommendations suggested below are to assist with specific considerations regarding screening including testing donors that may arise but are subject to revision as new data accumulate. Some screening considerations are germane for both living and deceased donation while other recommendations refer only to one or the other. Finally, it should also be recognized that no test is 100% sensitive or specific and both false positive and false negative results may occur. **Accordingly, the risk: benefit ratio for an individual living donor and transplant candidate should always be taken into consideration when making the final decision to perform a transplant. This includes the risk of proceeding with a transplant as well as the risk of deferring and/or potentially foregoing transplantation.**

Can SARS-CoV-2 be transmitted from living or deceased donors?

The risk of a COVID-19 infection from an infected living or deceased donor is unknown at this time. Factors that could impact the transmission of SARS-CoV-2 from an organ donor include viability of the virus within the blood and specific organ compartments for donors that are infected. Epidemiologic exposures need to be considered as potential risks for a donor being infected. Other factors to consider when assessing an organ for transplantation is the risk of the transplant candidate's mortality while on the transplant waitlist, as well as the impact that a COVID-19 donor-derived infection could have on the recipients' medical system and community.

How should living and deceased donors be screened and tested?

Donors should be screened epidemiologically, and by clinical history for suspected COVID-19 infection. In addition, testing of at least one sample from the respiratory tract by NAT for SARS-CoV-2 should be performed within 3 days of procurement whenever feasible recognizing that in some instances this may not be feasible for deceased donation due to time constraints or logistical issues. Additional testing for SARS-CoV-2 that may have been performed prior to donation should also be reviewed and made available.

The 28-day time frame recommended in the table may be overly conservative and subject to change but takes into consideration that while infectivity is unclear, shedding of virus can be prolonged.

While ground glass opacification has been well described in patients with confirmed SARS-CoV-2 infection, a CT scan of the chest should not be relied upon as part of a work up to exclude SARS-CoV-2 infection in potential deceased or living donors. This is a very non-specific finding and is not an appropriate diagnostic in donors when viewed in isolation.

Recommendations for donor screening and testing may change over time as more data accumulate.

- It should be recognized that no test is 100% sensitive or specific and false positive and false negative results may occur. Positive and negative predictive values will be impacted by the amount of locally circulating virus, specimen quality and assay performance.

- **For deceased organ donors** testing by NAT for SARS-Cov-2 should be obtained at least once from upper (nasopharyngeal, mid-nasal-turbinate oropharyngeal or saliva, tracheal aspirate) or lower respiratory samples (deep lavage, bronchoalveolar lavage).
    - The ideal site is not yet known with variable results noted in different studies. In addition, many assays, including those with more rapid turn times, are not currently validated for lower respiratory tract specimens. However, testing of the lower respiratory tract may be considered if possible, for lung donors.
    - Testing of whole blood or plasma by NAT for SARS-CoV-2 may provide additional information but a negative test should not take the place of testing the respiratory tract, as the rate of viremia in infected individuals is not known.

    - If donor testing is not available, or if the SARS-CoV-2 test result will not be available pre-procurement, then the epidemiologic and clinical criteria should be used to help determine if a deceased donor is more likely to have SARS-CoV-2. The recommendations for the different deceased donor scenarios are summarized in Table 2.

- **For living organ donors,** testing by NAT for SARS-CoV-2 should be at least once from upper (nasopharyngeal, mid-nasal-turbinate oropharyngeal or saliva) as close to the time of donation as possible
    - Living donors should be counseled on preventive strategies and encouraged to use preventive strategies, particularly in the 14 days prior to donation as much as possible to avoid infection.

Serologic assays for antibody against SARS-CoV-2 are increasingly available. Unfortunately, at this time interpretation of these assays is still in the early stage and likely varies with the different testing platforms. At this time, there is no recommendation to include these tests in the donor screening process. If used, the results should be viewed as adjunctive data points rather than as primary definitive information to determine final disposition of a potential donor. Issues to keep in mind include:

- IgM assays in general have a higher rate of false positive results compare to IgG assays. However, IgM true positive assays usually reflect recent infections.
- IgG positive assays may reflect passive antibody from blood products or immunoglobulin
- It is anticipated that a person with prior COVID-19 disease who has recovered will be IgG+, but it is not certain how long IgG positivity is maintained
- OPTN Policy 2.2 (OPO Responsibilities), #15, requires storage of blood for all deceased donors which could be used to retrospectively look for positive donor serology if needed.

(Relevant tables referenced above follow on the next page)

Table 1: Exposure, clinical and laboratory screening of potential donors for COVID-19

EPIDEMIOLOGIC SCREENING:

Does the potential donor meet any of the following criteria? Yes, No or Unknown

- Residing in an area in the preceding 21 days, where local COVID-19 transmission is occurring or travel to an area with local COVID-19 transmission
- Travel to or from a CDC high-risk area (Level 2- 3) (https://www.cdc.gov/coronavirus/2019-ncov/travelers/map-and-travel-notices.html)
- Direct contact with known or suspected case of COVID-19 in the preceding 21 days*
- Confirmed Diagnosis of COVID-19 in the last 28 days

*this includes being within six feet of a person with suspected or proven COVID-19.

Close contact can occur while caring for, living with, visiting, or sharing a healthcare waiting area or room with a COVID-19 case or having direct contact with infectious secretions of a COVID-19 case (e.g., being coughed on)

CLINICAL SCREENING:

Has the potential donor experienced any of the following symptoms in the last 21 days? Yes, no or unknown

- Fever (>38ºC or 100.3ºF or subjective fever)
- Malaise or flu like symptoms, + /- myalgias
- New cough
- Shortness of breath
- Unexplained abdominal pain, nausea, and/or diarrhea
- Loss of sense of taste and/or smell

LABORATORY TESTING:

- A NAT test result for the active presence of COVID-19 should be available as close to the time of procurement as possible
  - If a test is not available at the time of procurement or more than 3 days has occurred between the time of testing and procurement, then another sample from the respiratory tract should be obtained and results transmitted to transplant center as soon as possible to allow for infection prevention and contact tracing strategies to be instituted. Droplet precautions should be used while results are pending
- Documentation of the NAT test result should include identification of the type of sample and the specific test type (i.e., manufacturer).
- Antibody testing (serology) is in rapid evolution. Currently, several are FDA approved but none are approved specifically for deceased donors. Accordingly, interpretation must be made within context of local epidemiology and donor exposures based on clinical history screening
  - At this time, antibody testing should be used as adjunctive testing and not as primary testing to determine the acceptability of a donor
  - A rapid antigen test for SATS-CoV-2 was approved by the FDA on 5/8/2020 but has lower sensitivity when compared to NAT testing. At this time, it cannot be recommended for donor screening.

Table 2: Recommendations for Deceased Donor Screening and Testing to mitigate risk of COVID-19 from Deceased Donor Transmission

DECEASED DONORS WITHOUT RISK FACTORS
• Organs from deceased donors classified as low risk by epidemiological and clinical criteria should be used for transplantation. o Organs from deceased donors that are low risk and also tested negative for SARS-CoV-2 PCR should be used for transplantation o Organs from deceased donors that are low risk but not tested for SARS-CoV-2 PCR may also be used for transplantation. This recommendation is subject to modification if SARS-CoV-2 transmission from asymptomatic donors is confirmed in the future o Centers should consider informing all transplant candidates about SARS-CoV-2/COVID-19 during the period that it is circulating
• Organs from deceased donors who had recovered from COVID-19 and had resolution of symptoms greater than 28 days prior to procurement with repeated negative testing at least 24 hours apart are more likely to be safe to use
DECEASED DONORS WITH INTERMEDIATE RISK FACTORS
• Deceased donors who have some epidemiologic risk factors or clinical symptoms suggestive of COVID-19 infection are classified as intermediate risk and should be tested by NAT or SARS-CoV-2 **TESTING UNAVAILABLE** • If testing is not available for deceased donors in this category, we recommend NOT transplanting lungs or intestines o The decision to transplant other organs should be made with caution after careful consideration of the risks and benefits. This decision-making should include the candidate or their proxy and discussion of the lack of currently approved therapies. Transplant programs accepting organs from these donors should consider placing recipients in contact~~,~~ and airborne isolation o Consideration should include: <u>Has > 28 days occurred since presumptive diagnosis of SARS-CoV-2 infection?</u> • Informed consent includes educating the candidate and their family about the risk- benefits of accepting a specific organ for transplantation. • As per OPTN Policy 2.2, OPOs maintain blood specimens appropriate for serologic or NAT testing on all deceased donors that can be made available for retrospective testing. These may be of value if a concern for suspected donor derived infection arises after transplantation. • While not mandated, storage of respiratory or other specimens, in a fashion suitable for PCR testing may also be valuable if subsequent donor derived infection is suspected. **TESTING AVAILABLE** • Organs from deceased donors that have epidemiological risk factors or are positive for clinical criteria but nonetheless **test negative for SARS-CoV-2 PCR** during the OPO evaluation should be used with caution given the reports of false negatives. o Some centers advocate having two PCR assays, but the data are not sufficient to support or refute this recommendation at this time o The decision-making should include the candidate or their proxy. o Transplant programs accepting organs from these donors should consider placing recipients in airborne isolation.
DECEASED DONORS WITH ACTIVE INFECTION, HIGH RISK, or TEST SARS-CoV-2 POSITIVE
• At this time, it is recommended that organs not be transplanted from deceased donors at this time who have any of the following: o Active COVID-19 infection o Test positive for SARS-CoV-2 as part of the donor hospital or OPO evaluation o Are less than 28 days from resolution of clinical symptoms of a past COVID-19 infection

Table 3: Preliminary Living Donor Recommendations to mitigate risk of COVID-19 Donor Derived infection and prevent harm to the donor

• We do not recommend using organs from a living donor with active COVID-19 at this time
• All living donors should be counseled about preventive methods of acquiring SARS-CoV-2 including: ➢ self-quarantining ➢ frequent hand washing ➢ maintaining social distance if out in public; and ➢ mask or face covering if out in public.
• All living donors should have an upper respiratory sample (Nasopharyngeal, Mid-nasal turbinate, oropharyngeal) tested by PCR for SARS-CoV-2 as close to the time of donation but no less than 3 days prior to donation. Test results should be available prior to transplantation
• Living donors who are classified as high risk should have donation postponed until they are at least 28 days beyond symptom resolution and have a negative SARS-CoV-2 PCR test
• Consider delaying transplant for living donors who are classified as intermediate risk due to exposure questions but who have no symptoms of illness for 14 days o They should be counseled about ways to decrease transmission
• **During periods of local transmission of SARS-CoV-2, temporary suspension of elective living donor transplantation may need to be considered to protect the potential donor as well as the recipient**

The current outbreak is unpredictable. During widespread community-transmission, healthcare infrastructure and capacity issues may have further impact on donation and transplantation. These recommendations will be regularly updated to account for the changing epidemiology and new information regarding treatment and testing.