Eye Bank Association of Australia and New Zealand

Eye Bank Association of Australia and New Zealand (EBAANZ)
32 Gisborne St, East Melbourne VIC 3002

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EBAANZ MEDICAL ADVISORY COMMITTEE NOTIFICATION

UPDATED GUIDANCE AND COVID-19 EYE DONOR SCREENING RECOMMENDATIONS

Executive Summary:

The EBAANZ Medical Advisory Committee will continue to update its guidance and screening recommendations as the COVID-19 pandemic evolves based on the latest guidelines from the TGA as well as available scientific evidence.

These recommendations are designed for recipient and recovery technician safety and specify criteria for donor eligibility.

The EBAANZ Medical Advisory Committee has assessed the risk of COVID-19 in eye only donors and makes the below recommendations.

1. Donors should be determined **ineligible** who in the **10 days prior to death**:
   a) were diagnosed with COVID-19; OR
   b) tested positive for COVID-19 by direct viral testing methods (e.g., NAAT and/or antigen); OR
   c) had close contact‡ with a person diagnosed with or suspected to have COVID-19 AND developed signs and symptoms of COVID-19, regardless of a plausible alternative etiology or vaccination history

2. Donors should be evaluated for eligibility by a Medical Director when:
   a) in the 10 days prior to death, without a known close contact with a person diagnosed with or suspected to have COVID-19, experienced signs and/or symptoms consistent with COVID-19 not explained by a plausible alternative etiology; OR
   b) in the 10 days prior to death, had a known close contact with a person diagnosed with or suspected to have COVID-19 prior to death AND was asymptomatic; OR
   c) in the 11 to 20 days prior to death had a positive or reactive test for SARSCoV-2* AND had ongoing signs and/or symptoms of COVID-19, regardless of a plausible alternative etiology.

3. Vaccines and immunoglobulins
   d) For COVID-19 vaccines approved by the TGA no deferral required.

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DEFINITION: *CLOSE CONTACT
Due to the frequently changing definitions, the current definition of a close contact should be followed as per the Australian Government, Department of Health or as determined as one by a local state or territory health department.
DEFINITION: *SARS-CoV-2 Testing
Includes NAAT and antigen testing of nasal or nasopharyngeal specimens; excludes antibody testing. Donors who are severely ill (i.e., those requiring hospitalization, intensive care, or ventilation support) or moderately to severely immunocompromised may produce replication competent virus more than 20 days after symptom onset or, for those who were asymptomatic throughout their infection, the date of their first positive viral test. Therefore, extending the duration of precaution in this donor population up to 20 days after symptom onset may be warranted.
COVID-19 Signs
Development of any of the following signs may be consistent with COVID-19 infection: ● Acute respiratory distress syndrome ● Pneumonia ● Pulmonary computed tomography (CT) showing “ground glass opacities”
COVID-19 Symptoms
Development of acute symptoms may be consistent with COVID-19 infection. People with COVID-19 have reported a wide range of symptoms, ranging from mild to severe illness. ● Fever or chills ● Cough ● Shortness of breath or difficulty breathing ● Fatigue ● Muscle or body aches ● Headache ● New loss of taste or smell ● Sore throat ● Congestion or runny nose ● Nausea or vomiting ● Diarrhea
Persistent COVID-19 Symptoms (extending beyond 10 days from symptom onset)
● People with “long COVID-19” or “post COVID-19 syndrome” may have symptoms that overlap with active (acute) COVID-19 infection including but not limited to: fatigue, shortness of breath, cough, joint pain, chest pain, memory loss, concentration or sleep problems, muscle pain, headache, fast or pounding heartbeat, loss of smell or taste, depression, anxiety, fever, dizziness upon standing, and/or worsened symptoms after physical or mental activities. These symptoms can persist long after active infection or any detectable viral load and do not make the donor ineligible outside of the screening recommendations (1) ● Immunocompromised people may have symptoms up to 20 days after symptom onset with a persistently high viral load. Care should be taken to exclude these individuals from transplant donation due to potential for transmission of viable SARS-CoV-2.

DONOR ELIGABILITY

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PCR Test Status	COVID-19 Signs	COVID-19 Symptoms	Plausible Alternate Etiology (signs/symptoms)	Close Contact	Donor Fully Vaccinated	Eligibility
Positive within the last 10 days	Yes or No	Yes or No	Yes or No	Yes or No	Yes or No	Not Eligible
Negative pre-mortem	Yes	Yes or No	Yes	Yes	Yes or No	Medical Director Review
				No	Yes or No	Eligible
			No	Yes or No	Yes or No	Not Eligible
	No	Yes	Yes	Yes	Yes or No	Medical Director Review
				No	Yes or No	Eligible
			No	Yes or No	Yes or No	Not Eligible
		No	N/A	Yes	Yes	Eligible
					No	Medical Director Review
				No	Yes or No	Eligible
Not done	Yes	Yes or No	Yes	Yes	Yes	Medical Director Review
					No	Not Eligible
				No	Yes or No	Medical Director Review
			No	Yes or No	Yes or No	Not Eligible
	No	Yes	Yes	Yes	Yes	Medical Director Review
					No	Not Eligible
				No	Yes or No	Not Eligible
			No	Yes or No	Yes or No	Medical Director Review
		No	N/A	Yes	Yes	Medical Director Review
					No	Not Eligible
				No	Yes or No	Eligible

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NOTES

Progression in our understanding of the utility of donor screening for the SARS-CoV-2 virus, the risk of transmission via corneal transplantation and means to minimize this risk will allow for the continued provision of safe corneal tissue to patients while minimizing the wastage of suitable donor corneal tissue. Eye bankers and corneal surgeons should continue to keep in mind the following regarding the safety of corneal tissue:

1. COIVD-19 remains a highly infectious and serious risk to eye bank employees and every effort should be taken to avoid potential transmission in the workplace
2. EBAANZ Medical Standards require use of a single povidone iodine donor preparation; povidone iodine has documented in vitro viricidal activity against coronaviruses.
3. Individuals who have received non-replicating, inactivated, or RNA-based COVID-19 vaccines are not precluded from donating cells, tissues, or cellular or tissue-based products.
4. EBAANZ acknowledges that other associations, hospital systems, eye banks, departments of health, or governments may require that all donors be tested for COVID-19. Individual eye banks should establish a protocol to ensure access to testing notification and results obtained by partner agencies to prevent discordant resulting and/or discovery of results after release of tissue for transplant use.
5. EBAANZ is not aware of any currently available or readily accessible testing that has been validated for detecting COVID-19 for either living or post-mortem donor testing.
6. In March 2022, the EBAA updated their COVID-19 screening recommendations and reduced the donor referral period for COVID-19 deferral from 14 to 10 days (2).
7. There continues to be no known reported cases of transmission of SARS-CoV-2, MERS-CoV, or any other coronavirus via transplantation of ocular tissue (3).

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RISK OF TRANSMISSION OF SARS-CoV-2 TRANSMISSION

Presence of SARS-CoV-2 in the Tear Film

- Theoretical pathways by which SARS-CoV-2 may be transmitted through corneal transplantation include viral presence in the tear film and viral binding and/or replication on the ocular surface and within the cornea (4).
- SARS-CoV-2 has been detected in the tear film of patients using RT-PCR testing (4).

Presence of SARS-CoV-2 Receptors on the Ocular Surface and in the Cornea

- Recent reports have established the presence of SARS-CoV-2 viral entry factors on the ocular surface and within the cornea (5, 6).

SARS-CoV-2 Can Infect Ocular Tissue In Vitro and In Vivo

- Recently reported data indicate that SARS-CoV-2 can infect cultured corneal, limbal, conjunctival, and endothelial cells in vitro and remains viable in storage media for 14 days (7)
- A study examining intentional ocular (conjunctival) infection of rhesus macaques demonstrated subsequent pulmonary infection and a sustained weak viral load in the lacrimal gland, conjunctiva, and optic nerve after autopsy (8).

Presence of SARS-CoV-2 in Human Post-mortem Ocular Tissues

- Evidence for the presence of SARS-CoV-2 in the human cornea is provided by 2 recently published studies.
- In a post-mortem study of 132 ocular tissues from 33 potential donors who were screened out for surgical use, which included conjunctiva, corneal epithelium, anterior cornea, posterior cornea, and vitreous samples, 17 were positive for SARSCoV-2 RNA (9).
- Another study that examined corneas from 11 individuals who died of COVID-19 infection demonstrated the presence of SARS-CoV-2 RNA in 6 of the 11, although the investigators were not able to detect viral structural proteins or isolate infectious virus from the corneas (10).

EVIDENCE AGAINST A RISK OF SARS-CoV-2 TRANSMISSION

In Vitro Virucidal Activity of Povidone-Iodine Against Coronaviruses

- Current EBAANZ Medical Standards requires exposure of povidone-iodine to the ocular surface during processing ocular tissue.
- In vitro studies have demonstrated a rapid virucidal effect of povidone-iodine on SARS-CoV and SARS-CoV-2, it would likely inactivate all infectious virus on the ocular surface (11) (12).
- It is not known if infectious virus that is intracellular or within deeper layers of the ocular tissue would be eliminated by povidone-iodine application to the ocular surface.

SARS-CoV-2 Does Not Replicate in Human Corneal Explants

- In an ex vivo human corneal culture model, investigators studying the ability of HSV-1, Zika virus, and SARSCoV-2 to cause infection and replicate found that unlike HSV-1 and Zika virus, SARS-CoV-2 was not able to infect and replicate within human corneal explants, as demonstrated by quantitative RT-PCR (13).
- The authors postulated that there may be a local pathway that prevents efficient SARS-CoV-2 infection of the ocular surface, despite the presence of viral entry factors.

Absence of SARS-CoV-2 in Human Postmortem Ocular Tissues

- Two publications have reported the results of quantitative RT-PCR testing for SARS-CoV-2 RNA in a variety of ocular tissues, including corneal epithelium, stroma and endothelium, bulbar conjunctiva, and aqueous

aspirates from individuals with confirmed COVID-19 infection before death. The investigators failed to identify SARS-CoV-2 RNA in any of the 20 corneas from 10 donors or in any of the extracorneal ocular tissues from the 12 eyes from 6 donors who were tested (14) (15).

Absence of SARS-CoV-2 Transmission Through Corneal Transplantation from Infected Donors

- The Eye Bank Association of America has reported 8 cases in which corneal tissue from COVID-19 infected donors were transplanted in the United States. Only one of the 8 recipients developed COVID-19, attributed to community acquisition rather than via corneal transplantation (3).

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On behalf of the EBAANZ Medical Advisory Committee.

Regards,

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