

Is This Organ Donor Safe?

Donor-Derived Infections in Solid Organ Transplantation



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KEYWORDS

- Transplant infections • Donor-transmitted infections • Donor-derived infections
- Organ donor screening • Lymphocytic choriomeningitis virus

KEY POINTS

- Organ donor-derived infections are uncommon but may cause significant morbidity and mortality in transplant recipients.
- Diagnosis of infection in deceased donors may be challenging due to reliance on next of kin to provide critical medical and social history, the short time available for evaluation and testing, and the lack of rapid, sensitive assays for uncommon organisms.
- Growing experience with the use of donors at increased risk for infection with human immunodeficiency virus, hepatitis B virus, and hepatitis C virus suggests that these donors may be used with caution and informed consent of the recipients.
- Donors with unrecognized meningoencephalitis may transmit multiple infections including viruses, for which limited therapies exist.
- Careful screening of donors is paramount to improving the safety of organ transplantation.

In 2017, more than 10,000 deceased donors provided organs for more than 28,000 patients in the United States.¹ Although advances in critical care and immunosuppressive therapy have facilitated the use of more deceased donors and improved the outcomes of many transplant procedures, infection remains a common and significant complication of solid organ transplantation (SOT).² Causes of post-transplant infection include health care-associated infection during hospitalizations, community-acquired infection, and reactivation of latent infection in the recipient. Transmission of infection from donor to recipient, although less common than the other etiologies, ranges from the routine to the devastating. Although donor-derived infections, such as cytomegalovirus (CMV), are well-studied, anticipated, and able to be prevented in most

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cases, the number and variety of pathogens transmitted with transplantation continue to grow (**Box 1**).^{3–31}

RISK OF INFECTION IN ORGAN DONORS

Most organs transplanted in the United States are from deceased donors, who often require intensive medical care prior to becoming candidates for donation, with mechanical ventilation, indwelling vascular and urinary catheters, and administration of broad-spectrum antimicrobials. As a result of intensive care, donors may become colonized or infected with resistant bacterial pathogens as well as fungi, including *Candida* and *Aspergillus*. In many cases, donors with documented bacterial infections on effective antimicrobial therapy may be used when the recipients are also treated; caution should be used with multidrug resistant organisms and infections of the allograft itself. Donors may also harbor latent infections (eg, *Histoplasma*, *Coccidioides immitis*, *Mycobacterium tuberculosis*, and strongyloidiasis), based on their epidemiologic exposures. When transplanted into a recipient on immunosuppressive therapy, these latent infections may reactivate, causing disseminated disease. Because 1 donor may provide organs to as many as 8 recipients, who may be scattered across multiple transplant centers, states, and regions, prompt recognition of donor-derived infections and communication between transplant centers and organ procurement organizations (OPOs) is critical to improving outcomes of these often devastating infections.

WHEN TO SUSPECT DONOR-DERIVED INFECTION

In most cases, infections transmitted from an organ donor present early post-transplant, often in the first 6 weeks. Some pathogens with long incubation periods or latent infection, however, may take months to even years to present in the immunocompromised transplant recipient. Most outbreaks of infection have been identified when more than one recipient of an organ from a common deceased donor develops similar symptoms and signs.^{8–12} Because recipients are often hospitalized in different transplant centers and may be under the care of different teams within the same institution, recognition of a pattern of clinical findings may be difficult. If a recipient develops fever, leukocytosis, leukopenia, or other potential signs of infection early post-transplant, and donor-derived infection is considered a possibility, the responsible OPO should be contacted to discuss the findings and determine whether other recipients of organs from the same donor are experiencing similar illnesses. State public health departments and the Centers for Disease Control and Prevention (CDC) can also be of assistance in investigating the cause of an outbreak of infection.

SCREENING ORGAN DONORS FOR INFECTION

Screening potential donors for infection remains crucial to improving the safety of organ transplantation. The United Network for Organ Sharing is contracted by the Department of Health and Human Services to serve as the Organ Procurement and Transplantation Network (OPTN), responsible for policy development and oversight of SOT in the United States. The policies of the OPTN and the experience of the routine transplant infectious disease community have resulted in recommendations for routine screening of potential donors for several pathogens (**Box 2**).^{32–35} Screening for antibodies to HTLV types I and II had been routine for many years, but with the prevalence

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