

Molecular Testing for Transplant Recipients

Advances in transplant medicine have produced immunosuppressive and therapeutic agents that have improved the outcomes of transplant recipients diagnosed with viral infections. Even with such improvements, new viral infections or reactivation of endogenous, latent viruses can lead to clinical manifestations that contribute to morbidity and mortality in transplant recipients.¹ Molecular testing for transplant-associated viruses has replaced most serologic and in vitro culture methods for the diagnosis and monitoring of infection. Furthermore, quantitative molecular tests (viral loads) allow the customization of antiviral and immunosuppressive therapies to prevent and treat infection.^{2,3} These molecular tests allow for improvements in viral detection and quantitative monitoring, helping to minimize the clinical impact of viral infections and improve the outcome of patients undergoing organ and tissue transplantation.^{1,2,4}

BK Virus

BK virus (BKV) is a member of the polyomaviruses. BKV is associated with a variety of clinical features in the immunocompromised host: viremia, viruria, ureteral lesions, and cystitis.^{5,6} BKV infections are common, with more than 70% of the general population worldwide presenting with serological evidence of exposure to BKV.⁷ In many individuals, the virus remains latent after initial infection.⁸ BKV-associated nephropathy has emerged as a cause of allograft failure linked to immunosuppressive agents, affecting up to 8% of kidney transplants.⁹ BKV is also common in bone marrow transplant patients with hemorrhagic cystitis.¹⁰ The BKV viral load in plasma and urine has been shown to be higher in patients with BKV nephropathy than in those without nephropathy.⁹ Testing for BKV DNA in plasma from renal-allograft recipients by PCR is a sensitive and specific method for identifying viral nephropathy.¹¹

Quantitative Testing

[BK Virus Quantitation, Real-time DNA PCR \(138962\)](#)

[BK Virus Quantitation, Real-time PCR, Urine \(138880\)](#)

Cytomegalovirus (CMV)

CMV is a common infectious agent among transplant recipients and can manifest in many ways in immunocompromised patients, including pneumonia, colitis, and retinitis.¹² Chronic CMV infections increase the risk of graft rejection in transplant recipients and are also associated with subsequent infections with other microbiological pathogens.³ Monitoring CMV in conjunction with 2 antiviral strategies (preemptive and prophylactic antiviral therapy) can decrease or prevent clinical complications in patients after allogeneic hematopoietic stem cell transplantation (HSCT).¹³⁻¹⁴ Preemptive antiviral therapy has greatly reduced the incidence and mortality rate of CMV disease, especially when Ag- or PCR-based CMV monitoring is performed.¹⁴ The International Herpes Management Forum recommended PCR testing for diagnosis of CMV infection and CMV load measurements for prognosis and for monitoring response to anti-CMV therapy in their 2004 guidelines for diagnosing and monitoring CMV in transplant patients.¹⁵

Qualitative Testing

[Cytomegalovirus \(CMV\) DNA PCR General \(138693\)](#)

Quantitative Testing

[Cytomegalovirus \(CMV\) DNA PCR Plasma \(139149\)](#)

[Cytomegalovirus \(CMV\) DNA PCR Urine \(139144\)](#)

Epstein-Barr Virus (EBV)

Epstein-Barr virus-associated lymphoproliferative disorder (EBV-LPD) is a serious complication following many bone marrow transplants and, in some cases, may be fatal.¹⁶ Posttransplant lymphoproliferative disorders (PTLD) are also associated with solid organ transplant, and a spectrum of clinical features makes diagnosis difficult.¹⁷ PCR testing for EBV may allow for early detection and monitoring and facilitate therapy decisions that minimize the spread of disease.¹⁸ For example, recipients of T-cell depleted transplants are at high risk for developing EBV-LPD with even low virus levels (quantified viral DNA levels of 1000 genome equivalents/mL).^{4,17} Early diagnosis of EBV-PTLD is important, because many patients respond to reduction in immunosuppression, especially if PTLD is detected at an early stage.¹⁸

Qualitative Testing

[Epstein-Barr Virus DNA PCR, Qualitative \(138289\)](#)

Quantitative Testing

[Epstein-Barr Virus, Quantitative, Viral Load \(138230\)](#)

Human Herpesvirus 6 (HHV-6)

Human herpesvirus 6 reactivation is common after allogeneic hematopoietic stem cell transplant (HSCT), because many patients are latently infected with 1 or more viral strains.¹⁹⁻²⁰ HHV-6 is associated with subsequent delayed monocyte and platelet engraftment, increased platelet transfusion requirements, all-cause mortality, grade 3-4 graft-versus-host disease (GVHD), and CNS dysfunction.²⁰ Two HHV-6 subtypes are known, with most primary HHV-6 infections caused by subtype 6B.²¹ Both subtypes can be detected in a highly sensitive and very specific manner with real-time PCR.

Qualitative Testing

[Human Herpesvirus Type 6 \(HHV-6\) DNA PCR \(138479\)](#)

Quantitative Testing

[HHV-6 Quantitation DNA PCR \(139310\)](#)





Other molecular tests for transplant patients include:

- Adenovirus (138164)
- Chlamydia pneumoniae (138263)
- Herpes Simplex Virus 1-2 (HSV-1/2) (138651)
- Mycoplasma and Ureaplasma (138778)
- Mycoplasma pneumoniae (138420)
- Norovirus (138307)
- Parvovirus (138644)
- Parvovirus, Quantitative (139326)
- Respiratory Virus Panel (139250)
- Toxoplasma (138602)
- Varicella-Zoster Virus (VZV) (138313)

For additional information, please refer to the *LabCorp Directory of Services and Interpretive Guide* or contact client services at 800-582-0077.

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