

# Transplantation and Adherence

## Evaluating tacrolimus usage in pediatric patients with cancer

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**BACKGROUND:** Researchers have estimated that about 50% of pediatric patients with chronic illness adhere to tacrolimus therapy, a medication responsible for preventing critical side effects in patients undergoing hematopoietic stem cell transplantation (HSCT).

**OBJECTIVES:** The purpose of this study was to describe patient adherence to tacrolimus by reviewing documentation from the electronic health record and therapeutic drug levels.

**METHODS:** This retrospective descriptive study examined 357 clinic visits by 57 patients undergoing HSCT. Direct (tacrolimus levels) and indirect (subjective reporting) measures were evaluated.

**FINDINGS:** The authors found that, in 51% of visits, adherence was not documented. The overall nontherapeutic drug level rate was 60%. Because of the small sample size, nonadherence did not statistically correlate with nontherapeutic levels. The findings highlight the need for adherence awareness, assessment, and documentation in clinical practice.

### KEYWORDS

adherence; tacrolimus; immunosuppression; HSCT; pediatric stem cell transplantation

### DIGITAL OBJECT IDENTIFIER

10.1188/20.CJON.E57-E64

**HEMATOPOIETIC STEM CELL TRANSPLANTATION (HSCT)** is an aggressive medical treatment associated with high morbidity and mortality rates. These rates are influenced by underlying disease, as well as complications that may occur during or immediately following the transplantation. The main risks of allogeneic HSCT are increased susceptibility to infection and transplant-related complications, such as graft-versus-host disease (GVHD). The process can be physically and emotionally difficult for children and their parent caregivers. HSCT recipients need to adhere to multifaceted outpatient regimens that require strict personal hygiene, environmental restrictions, and complex medication regimens (Morrison et al., 2017).

Adherence to immunosuppressant medications during the acute phase after transplantation is critical to prevent GVHD and avoid graft failure. GVHD is a major potential complication and occurs in about 35%–50% of all allogeneic transplantations (Murray et al., 2018; Zeiser & Blazar, 2017). GVHD is the effect of immunologic activation of donor lymphocytes attacking major and minor human leukocyte antigen mismatches from the recipient (Ferrara et al., 2009). Acute GVHD occurs in the first 100 days following transplantation. Survival rates range from 30% to 50%; however, morbidity and mortality can be decreased through prophylactic immunosuppressants. Immunosuppressant medications are a class of drug used to suppress the body's immune system to prevent rejection in solid organ and HSCTs. The most frequently prescribed immunosuppressive agents are cyclosporine and tacrolimus. Despite cost and unpleasant side effects, adherence is crucial to improved outcomes and increased quality of life. More complex medication regimens are associated with nonadherence; therefore, pediatric recipients of HSCT who must follow difficult post-transplantation regimens are at high risk for poor adherence (Coleman et al., 2012). Lack of adherence to any of these regimens can be life threatening.

### Rates of Adherence

Rates of adherence to recommended treatment have been reported at about 50% overall in pediatric patients. These rates are typically lower for patients with chronic disease when compared to acute illnesses adherence rates. Few studies have reported on treatment adherence rates in HSCT specifically for