ISHLT JOURNAL WATCH
November 2026 | Infectious Diseases

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Early pulmonary isolation of non-tuberculous mycobacterial organisms is associated with increased risk of death and chronic lung allograft dysfunction: A Lung Transplant Outcomes Group Cohort Study

Mezochow G, Griffiths S, Schaubel DE, Oyster M, et al. *JHLT* 2026 31 August | DOI: 10.1016/j.healun.2026.08.017

Study Highlights

Objective: Determine whether pulmonary NTM growth after lung transplant is associated with death or re-transplantation and with CLAD.

Methods:

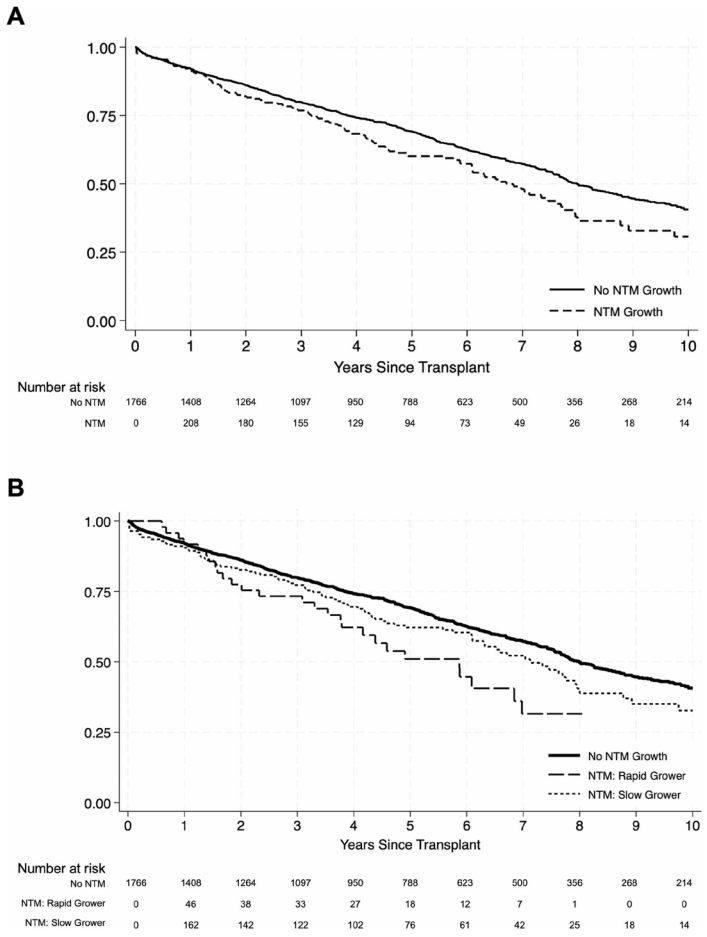
- Cohort of 1,766 adult lung recipients from five US centers, transplanted between 2007 and 2022.
- Main exposure: NTM grown from a pulmonary sample in the first 365 days. Secondary exposures: growth at any time, rapid growers (growth within 7 days of culture) versus slow growers, and repeated growth.
- Death or re-transplantation: time-dependent Cox models stratified by center. CLAD: cause-specific hazards models.

Results:

- 223 recipients (13%) grew NTM in year one, at a median of 61 days after transplant. M. avium was the most common first isolate (127 recipients). 340 (19%) grew NTM at some point during follow-up.
- Year-one growth was associated with a higher hazard of death or re-transplantation (HR 1.30, 95% CI 1.05–1.60). This was driven by rapid growers (HR 2.17, 95% CI 1.42–3.31). Slow growers were not significant.
- Year-one growth was associated with a higher hazard of CLAD (HR 1.29, 95% CI 1.03–1.62). This was driven by slow growers (HR 1.33, 95% CI 1.04–1.69). Rapid growers were not significant.

Conclusions:

Early NTM growth was common and associated with higher hazards of death or re-transplantation and of CLAD. The death signal came from rapid growers and the CLAD signal from slow growers.



Time to death or re-transplantation by early NTM growth.
(A) Any early growth versus none.
(B) Rapid growers, slow growers, and no growth.

Reviewer's Comments

- This five-center cohort, with a median follow-up of 5.0 years, adds to earlier studies that were largely single-center with small samples.
- Findings were similar whether NTM grew alone or alongside other organisms; the results are not driven only by polymicrobial culture.
- Rapid-growing NTM were strongly associated with death or re-transplantation, with similar results for M. abscessus and other rapid growers. Infection appeared to account for a larger share of deaths in early growers (26% vs 11%).
- Slow-growing NTM was associated with CLAD but not mortality. The authors suggest NTM may be a marker of chronic airway injury or dysbiosis rather than the cause of progressive invasive disease.
- The authors suggest that clinician responses to isolation, such as reducing immunosuppression, may affect outcomes. Future work should identify which recipients need long-term therapy and how to manage immunosuppression during treatment.

Limitations

- Observational design, so causation cannot be inferred. NTM was defined by culture rather than disease because imaging and symptom data were unavailable.
- Culture indications and frequency varied. 53% of growers had only one positive occurrence. Pre-transplant NTM could not be separated from newly acquired infection.
- Immunosuppression and antimicrobial use were not available.
- Causes of death were registry-reported and not independently adjudicated.

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Maribavir in lung transplant recipients with cytomegalovirus infection: real-life experience

Veit T, Trost S, Kauke T, Engels N, et al. *Infection* 54, 2797-2807 (2026) | DOI: 10.1007/s15010-026-02927-3

Study Highlights

Objective: Provide real-life data regarding utilization and efficacy of maribavir for CMV infections in lung transplant recipients as well as to assess for resistance development while on this antiviral therapy.

Methods:

- Single-center, retrospective cohort study of 49 lung transplant recipients who received maribavir for refractory CMV infection and/or disease with or without resistance.
- Patients were assigned as responders or non-responders. Non-responders had either: persistent viral load after 4 weeks of therapy without log 10 decrease, no CMV viremia clearance after 8 weeks of antiviral therapy, or an increasing viremia over the treatment course.

Results:

- Overall, 34 patients were responders and 15 non-responders.
- 16 responders had relapse after stopping maribavir with 14 successfully retreated with maribavir. 5 patients had a second relapse.
- Median treatment duration was 82 days.
- 19 patients had adverse events that were mainly mild and gastrointestinal, including diarrhea, nausea, vomiting, abdominal pain, and dysgeusia. 4 required medication discontinuation. No nephrotoxicity or myelosuppression was seen.
- 14 of 18 patients with resistance testing had maribavir resistance at a median of 132 days. Multivariable logistic regression identified only CMV viral load on maribavir initiation as associated with resistance (p=0.011).

Conclusions: With limited antiviral options for CMV infections, maribavir is an important antiviral option, especially given its favorable side effect profile. Close CMV monitoring is needed both during and after maribavir treatment given the possibility of treatment failure, relapses, and resistance development.

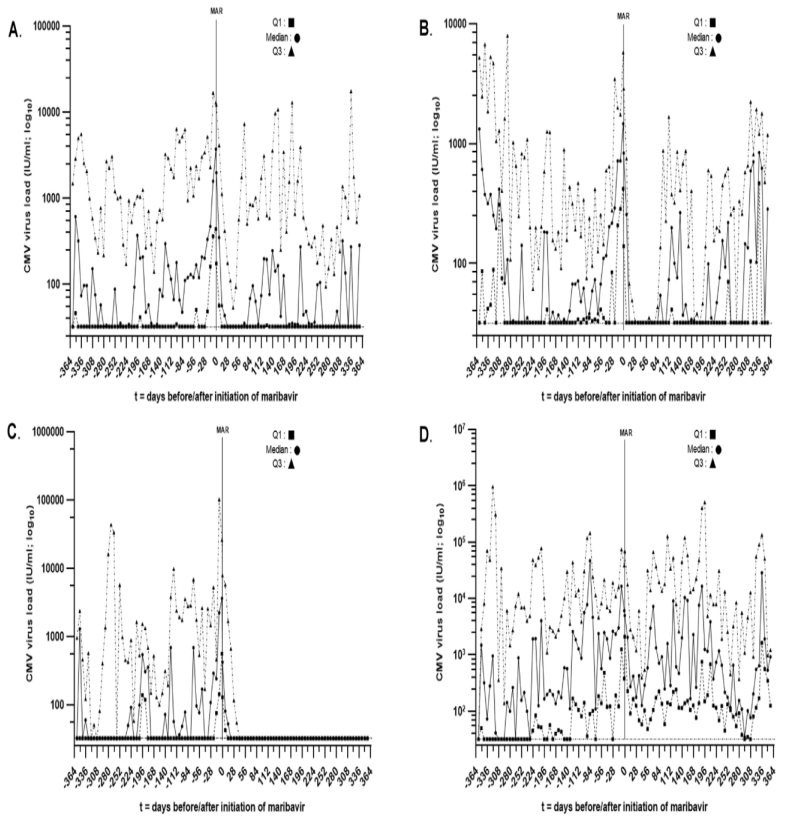

Figure 1 A-D shows CMV viral loads before and after maribavir in (A) all patients, (B) responders with relapse, (C) responders without relapse, and (D) non-responders.

Reviewer's Comments

- While most patients responded to maribavir, a significant portion of patients (15/49, 30.6%) did not respond and 14 developed maribavir resistance highlighting the need for close monitoring while on/after antiviral therapy given this risk of treatment failure and relapse.
- Maribavir was well-tolerated, which is encouraging given that alternative antiviral options for refractory CMV tend to have significant toxicities, such as myelosuppression or nephrotoxicity, neither of which were seen with maribavir.
- CMV viral load at maribavir initiation was associated with risk of maribavir resistance development, which should lead to consideration of alternative antiviral therapies initially for patients with refractory CMV and high viral loads with possible transition to maribavir once viral loads are improving.

Limitations

- A single-center study which may limit external generalizability.
- The almost eight-year time frame of this study will be affected by changes in clinical practice as well as heterogeneity in provider management.
- This study lacked a control group for outcome comparison to better evaluate treatment efficacy, duration, and resistance development for maribavir.
- All patients didn't have baseline genotypic testing, which may have resulted in a false assumption of resistance development while on therapy when a UL97 mutation was present prior to maribavir exposure.
- 10 patients received combination therapy with additional antiviral therapies while on maribavir, such as letermovir, foscarnet, CMV IgG, and/or CMV-specific T Cells. Combination therapy may have affected treatment outcomes that were attributed to maribavir.

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A phase 2 multicenter, prospective, randomized, double-blind study to assess the clinical and antiviral efficacy and safety of nitazoxanide for the treatment or norovirus in hematopoietic stem cell and solid organ transplant recipients

Boutin C-A, Callegari M, Florescu D, Nguyen M-H, et al. *Am Jour Transplant* 26(9), 2169-2181, Sep 2026 | DOI: 10.1016/j.ajt.2026.04.010

Study Highlights

Objective: To assess the safety and effectiveness of nitazoxanide in patients with a history of solid organ transplant (SOT) or hematopoietic stem cell transplant (HSCT) with norovirus infection.

Methods:

- Multi-center, double-blind, randomized placebo control trial
- Eligibility: SOT or HSCT recipients, ≥ 12 years old , active gastrointestinal symptoms, positive stool norovirus polymerase chain reaction within 14 days of enrollment.
- Randomized 1:1
  - Stratified by transplant type , duration of symptoms (< or ≥ 14 days), and age of participant (< or ≥ 18 years old).
- Intervention: Nitazoxanide 500 mg vs Placebo twice daily for 28 days.
- Follow-up: 180 days
- Efficacy Endpoints: (1) Patient reported symptoms, and (2) virologic efficacy – (a) time to first negative stool test up to 180 days and (b) comparing titer change between days 1 and 180.
- Safety Endpoints: Frequency of clinical, laboratory, and serious adverse events up to day 60.

Results:

- No difference in median time to symptom resolution.
- No difference in time to first negative stool test.
- No serious adverse events related to nitazoxanide.

Conclusions:

While it is unlikely to cause harm, the use of nitazoxanide does not seem to result clinical or virologic improvement of norovirus infection.

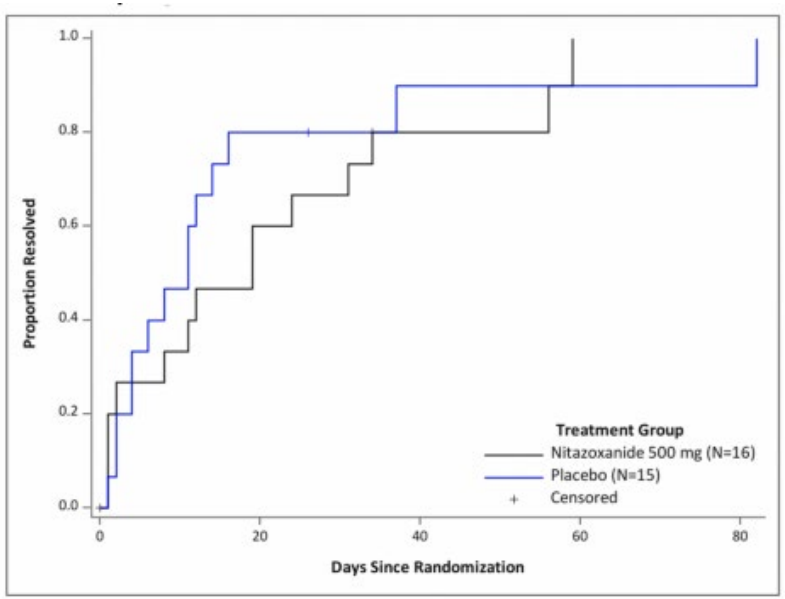

Figure 1: Kaplan Meier Curve for Intention to Treat Analysis

Subjects[b] with at least 1 of the following:	Nitazoxanide (N = 16)		Placebo (N = 15)	
	n	%	n	%
Unsolicited nonserious AE	2	13	2	13
Laboratory AE[c]	11	69	13	87
Serious AE	-	-	2	13
Hospitalization	4	25	7	47
	n	%	n	%
Graft loss	1	6	-	-
Death[e]	-	-	2	13

Table 1: Summary of Adverse Events by Treatment Group

Reviewer's Comments

- Although this double-blind, randomized, placebo-controlled trial did not demonstrate a benefit of nitazoxanide in SOT and HSCT recipients with norovirus infection, the limited statistical power of the study precludes drawing definitive conclusions regarding its efficacy.
- Enrolled far fewer participants than their initial target and had a significant amount of early termination (25% in nitazoxanide group, 33% in placebo group).
- A larger study of acute norovirus infection in SOT recipients showed statistically significant higher rates of symptom improvement with nitazoxanide (DOI: 10.1111/ctr.14594) though this was a retrospective study rather than a controlled trial.

Limitations

- Majority of participants (77%) had symptoms for ≥ 14 days at the time of enrollment
  - Would nitazoxanide have had an impact if administered earlier in symptom course?
- Confounding
  - Twice as many participants in the nitazoxanide group were on mycophenolate – could impact symptoms
- Underpowered
  - Would have needed to enroll 160 participants to achieve 90% power to detect a 50% reduction in median duration of symptoms (with 20% attrition).
  - Enrollment impacted by COVID pandemic
- Limited generalizability
  - 30 of 31 participants enrolled were SOT. Only 1 HSCT.