TREATMENT OF UTI

PREVENT INFECTION

→ To prevent UTIs, we administer prophylactic antibiotics. Trimethoprim-sulfamethoxazole (TMP-SMX) prophylaxis was associated with a reduced risk of sepsis and bloodstream infection and bacteruria . Prophylaxis did not reduce graft loss or mortality. [1]

→ This regimen also protects against infection with P. carinii . There is an added advantage in that TMP-SMX prophylaxis also appears to reduce the incidence of infections with L. monocytogenes, N. asteroides, and T. gondii [2]

→ In one trial that randomly assigned 82 kidney transplant recipients **to trimethoprim-sulfamethoxazole plus either fosfomycin** or placebo, the incidence of symptomatic **UTIs** during the **first seven weeks** posttransplantation **was lower in the fosfomycin group** compared with the placebo group. Rates of asymptomatic bacteriuria were similar between the two groups. [3]

→ For patients who are reported to be allergic to trimethoprim-sulfamethoxazole, we carefully assess reported adverse events to determine if patients are truly allergic and offer desensitization to those with true allergies. [1]

→ We provide **cephalexin 500 mg orally twice daily** for three months for the few who are unable to take trimethoprim-sulfamethoxazole . The decision of the most appropriate alternative agent to use for UTI prophylaxis will depend on the patient's current and past microbiology data and on resistance patterns at the transplant center. [1]

Duration of prophylaxis

→ The optimal duration of prophylaxis is unknown. Most transplant centers continue trimethoprimsulfamethoxazole for at least six months to one year posttransplantation . [4]

→ Some experts continue trimethoprim-sulfamethoxazole prophylaxis indefinitely . [5]

→ TMP-SMX prophylaxis with 1 single-strength TMP (80 mg)–SMX (400 mg) tablet daily for the first 6 months after transplantation is recommended to protect against UTIs particularly in kidney transplant recipients. [2]

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[1]- Green H, Rahamimov R, Gafter U, et al. Antibiotic prophylaxis for urinary tract infections in renal transplant recipients: a systematic review and meta-analysis. Transpl Infect Dis 2011; 13:441.

[2] - Rosemary Soave, Prophylaxis Strategies for Solid-Organ Transplantation, Clinical Infectious Diseases, Volume 33, Issue Supplement_1, July 2001, Pages S26–S31, https://doi.org/10.1086/320901

[3] - Rosado-Canto R, Parra-Avila I, Tejeda-Maldonado J, et al. Perioperative fosfomycin disodium prophylaxis against urinary tract infection in renal transplant recipients: a randomized clinical trial. Nephrol Dial Transplant

[4] - Muñoz P. Management of urinary tract infections and lymphocele in renal transplant recipients. Clin Infect Dis 2001; 33 Suppl 1:S53.

[5] - Horwedel TA, Bowman LJ, Saab G, Brennan DC. Benefits of sulfamethoxazole-trimethoprim prophylaxis on rates of sepsis after kidney transplant. Transpl Infect Dis 2014; 16:261.

Asymptomatic bacteriuria

TABLE 2 Treatment of asymptomatic bacteriuria and urinary tract infection in transplant recipients

Clinical presentation[a]	Suggested management
Asymptomatic bacteriuria (AB)	Routine treatment of AB is not recommended (see Treatment section). However, if two consecutive urine samples yield >10^5 of the same uropathogen in the first two months post-transplant, can consider treatment for 5 days.[*] This practice may have no benefit and may promote antimicrobial resistance; this practice has not been studied in the early transplant period. Beyond the early transplant period, studies have been performed and do not support treatment of AB. There is no role for empiric treatment of AB—await culture susceptibility and select the most narrow-spectrum antibiotic available. Do not treat AB if 2nd culture shows clearance of the initial AB or if a different organism is identified. Do not treat AB of multi-drug resistant bacteria.
Simple cystitis[b]	Third-generation oral cephalosporin OR amoxicillin-clavulanate OR ciprofloxacin OR levofloxacin. Nitrofurantoin is broad-spectrum but is not recommended if [*]CrCl < 30—see text. (Especially if patient recently receiving TMP-SMX, anticipate uropathogen to be resistant to TMP-SMX. Routine use of fosfomycin is not recommended; limit fosfomycin to multi-drug resistant cystitis.) Treatment duration 5-7 days.
Pyelonephritis/Complicated UTI—moderate/severe[b]	Piperacillin-tazobactam OR cefepime OR carbapenem, ±fluoroquinolone. Once culture susceptibility results available, complete 14-21 days of therapy with the most narrow-spectrum antibiotic available.

CrCl, estimated creatinine clearance; TMP-SMX, trimethoprim-sulfamethoxazole.

[a]See Table 1 and text for classification of clinical syndromes.

[b]During empiric antibiotic selection, consider risk of multi-drug resistant uropathogens. Review patient's prior cultures. While institutional antibiograms are pertinent, more resistance may be seen in KT recipients than in the general institutional antibiogram.

[*][Correction added on September 4, 2019, after first online publication: In the first sentence, "routinely" was removed from the phrase "not routinely recommended"; in the second sentence, "treatment for 5-7 days" was changed to "treatment for 5 days"; the sentence "Do not treat AB if 2nd culture shows clearance of the initial AB or if a different organism is identified" was added as the penultimate sentence.]

[*][Correction added on September 4, 2019, after first online publication: In the second sentence, "CrCl < 40" was changed to "CrCl < 30."]

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Multi-drug resistant UTI

→ For extremely drug-resistant Gram-negative bacteria such as Pseudmonoas spp and Klebsiella spp, **meropenem-vaborbactam, cef-tolozane-tazobactam, and ceftazidime-avibactam** offer new alterna-tives to colistin and aminoglycosides

→ However, it is essential that these new agents be reserved for highly selective settings when no other non-nephrotoxic choices remain.

→ USE with caution, the broadly active **oral agent fosfomycin** can be considered as an alternative for treatment of MDR UTI, particu-larly if limited to cystitis.

" do not recommend oral fosfomycin for treatment of pyelonephritis"

→ **better efficacy might be achieved with multiple doses of oral fosfomycin scheduled 48-72 h apart.**

→ Oral **pivmecillinam, has good activ-ity against ESBL-producing E. coli** and is an option for treatment of cystitis. While **doxycycline** are **FDA-approved for treatment of UTI,** there are little data reported for their use in renal transplant recipients and only 10%-13% of minocycline and 35%-45% of doxycycline is excreted in the urine. Treatment for can-dida UTI is covered elsewhere.

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