# Prevention of Recurrent Urinary Tract Infections in Women

## Antimicrobial and Nonantimicrobial Strategies

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**KEYWORDS**

• Recurrent urinary tract infections • Antimicrobial prophylaxis
• Non-antimicrobial strategies • Cranberries • Lactobacilli • Methenamine

**KEY POINTS**

- Recurrent urinary tract infections (UTIs) are common, especially in women.
- A differentiation must be made between persistence, relapse, and reinfection of the urinary tract. All recommendations concern patients with reinfections.
- In a persistent UTI, the cause must be evaluated. In a relapse of the UTI, the treatment can given for a longer period.
- Self-diagnosis and self-treatment of recurrences is reliable in premenopausal and postmenopausal women with recurrent UTIs.
- Methenamine hippurate can be used for a maximum of 1 week to prevent UTI in patients without urinary tract abnormalities.
- The use of ascorbic acid (vitamin C) is not recommended in the prevention of UTIs.
- In premenopausal women with recurrent UTIs, the following prophylaxis can be considered to decrease the number of recurrent episodes:
  - Daily or postcoital low-dose antimicrobial therapy
  - Cranberry products
  - *Lactobacillus crispatus* intravaginal suppository
- In postmenopausal women with recurrent UTIs, the following prophylaxis can be considered to decrease the number of recurrent episodes:
  - Daily or postcoital low-dose antimicrobial therapy
  - Topical estrogens
  - Oral capsules with *L rhamnosus* GR-1 and *L reuteri* RC-14

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## INTRODUCTION

Urinary tract infections (UTIs) are common infections, especially in women. Recurrent UTIs are defined in the literature by 3 episodes of a UTI in the preceding 12 months or 2 episodes in the preceding 6 months. Approximately 50% to 70% of women have a UTI sometime during their lifetime and 20% to 30% of this group have recurrent UTIs.[1,2] In general, it is recommended to exclude anatomic or functional abnormalities of the urogenital tract as a cause of recurrent UTIs in men and postmenopausal women. In premenopausal women, the yield of most diagnostic procedures for this indication is low.[3]

There are 4 patterns of response of bacteriuria to therapy: cure, bacteriologic persistence, bacteriologic relapse, or reinfection. Bacteriologic persistence is persistence of bacteriuria with the same microorganism after 48 hours of treatment. Relapse (clinical and bacteriologic) is an infection with the same microorganism that caused the initial infection and usually occurs within 1 to 2 weeks after the cessation of treatment. A relapse indicates that the infecting organism has persisted in the urinary tract despite a good clinical response during treatment. Reinfection is an infection after sterilization of the urine. Most of the time another bacterial species is cultured. Both persistence and relapse may be related to inadequate treatment. Therefore, it is important to determine whether recurrent UTIs are relapses or reinfections and to make a differentiation between these patterns, because this has treatment consequences. Experts have the opinion that in a persistent UTI the cause must be evaluated. In a relapsed UTI, the treatment can be given for a longer period. This review only discusses the prevention of reinfections. Because women have the majority of recurrent UTIs, and recurrent UTIs in men might be considered chronic bacterial prostatitis, which is a different disease with different prevention and treatment strategies, the content of this article is limited to recurrent UTIs in women.

The first consideration in prevention of recurrent UTIs is to address modifiable behavioral practices. For example, urination after sexual intercourse in women is believed to decrease the incidence of UTIs. For some of these behavioral strategies, scientific evidence is missing, but they seem logical from a pathophysiologic point of view. Other effective strategies for the prevention of recurrent UTIs can be divided into antimicrobial or nonantimicrobial strategies.

## ANTIMICROBIAL PROPHYLAXIS

Low-dose antimicrobial therapy remains an effective intervention to manage frequent, recurrent, acute uncomplicated UTI. The antimicrobial may be given as daily or every-other-day therapy, usually at bedtime, or as postcoital prophylaxis. Experts suggest an initial duration of prophylaxis of 6 months; however, 50% of women experience recurrence by 3 months after discontinuation of the prophylactic antimicrobial. When this occurs, prophylaxis may be reinstituted for 1 or 2 years.

A Cochrane review[1] included 19 studies involving 1120 women. During active prophylaxis, the rate range of microbiological recurrence per patient-year was 0 to 0.9 person-year in the antibiotic group versus 0.8 to 3.6 person-years with placebo. The relative risk (RR) of having 1 microbiological recurrence was 0.21 (95% CI, 0.13–0.34) favoring antibiotic, and the number needed to treat (NNT) was 1.85 women. For clinical recurrences, the RR was 0.15 (95% CI, 0.08–0.28) and the NNT was also 1.85 women. The RR of having 1 microbiological recurrence after prophylaxis was 0.82 (95% CI, 0.44–1.53). This Cochrane review, however, was published nearly 10 years ago and antimicrobial resistance has increased since then. Therefore, it is not clear whether the same effectiveness will be reached in the present day. The number