

# Template



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## Urinary Tract Support

Template by Fullscript

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Preview

Evidence

### Evidence rating

The following protocols were developed using only **a,b,c,d**-quality evidence

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### Overview

## Introduction

Urinary tract infections (UTIs) are among the most common bacterial infections, affecting individuals of all ages and demographics, with higher prevalence in women due to anatomical and physiological factors. These infections can lead to significant discomfort and complications if left untreated, and recurrent infections can impair quality of life. (Bono 2024)(Medina 2019)

This protocol provides evidence-based ingredient recommendations to support both prevention and concomitant management of UTIs alongside standard care. It emphasizes a proactive, integrative approach by focusing on strengthening defenses and promoting healthy practices to reduce recurrence while supporting recovery and enhancing treatment efficacy during acute infections.

By incorporating clinically relevant ingredients, healthcare providers can reduce the frequency of recurrence, support the body's defenses during treatment, and promote overall genitourinary wellness.

## Goals of the protocol

- **Prevention:** Strengthen urinary tract defenses to reduce the risk of recurrent infections.
- **Treatment support:** Provide adjunctive support during antibiotic therapy or other primary treatments to alleviate symptoms, enhance microbial balance, and promote recovery.

### D-mannose

## Prevention of recurrent UTIs

### D-mannose

#### 2 g once daily or 1 g twice daily for prevention of recurrent UTIs

- An animal study found that D-mannose works by competitively inhibiting bacterial adherence via FimH adhesin, effectively preventing *Escherichia coli* (*E. coli*) from attaching to urinary tract epithelial cells. (Scribano 2020)
- D-mannose reduces the recurrence of UTIs by inhibiting bacterial adhesion to the urothelium. Studies have shown it to prolong UTI-free periods and improve the quality of life in both catheter and non-catheter users. (Kyriakides 2020)
- A randomized controlled trial (RCT) found that D-mannose significantly reduced the recurrence rate of UTIs in women compared to placebo and was as effective as prophylactic antibiotics, with fewer side effects. (Kranjčec 2014)
- Multiple studies report high tolerability of D-mannose, with no significant adverse effects. Long-term use has shown to be safe and effective in recurrent UTI prevention. (De Nunzio 2021)

### Cranberry extract (*Vaccinium macrocarpon*) (proanthocyanidins (PACs))

## Cranberry extract (*Vaccinium macrocarpon*) (proanthocyanidins (PACs))

**Cranberry extract (PACs) is typically used in doses of 120–1,600 mg daily for up to 12 weeks**

- Cranberry products, particularly those rich in PACs, reduce the risk of recurrent UTIs in women with a history of recurrent UTIs and in children. Cranberry products reduced the incidence of symptomatic, culture-verified UTIs by 30–50% compared to placebo in multiple studies. (Williams 2023)
- A meta-analysis of RCTs demonstrated that cranberry PACs inhibit bacterial adhesion to the bladder wall, significantly reducing UTI recurrence rates in women. (Jepson 2012)
- A study found that cranberry supplementation decreased UTI recurrence by 39% compared to placebo in women with a history of recurrent infections. (Stapleton 2012)
- Cranberry extracts were found to have similar effectiveness to low-dose antibiotics in preventing UTIs, with fewer adverse effects and no risk of antimicrobial resistance. Furthermore, Cranberry products significantly reduced the need for antimicrobial therapy, decreasing antibiotic use by 68% in women with recurrent UTIs, suggesting a role in reducing antibiotic resistance. (Jeitler 2022)(McMurdo 2008)
- The anti-adhesive properties of PACs in cranberries prevent the attachment of uropathogenic *E. coli* to bladder walls, a mechanism supported by in vitro and in vivo studies. (Guay 2012)

## Probiotics

# Concomitant support

## Probiotics

### 10–20 billion CFU daily of *Lactobacillus rhamnosus* and/or *Lactobacillus reuteri*

- Probiotics help restore vaginal and urinary microbiota balance, reducing colonization by uropathogens. (Stapleton 2012)
- *Lactobacillus rhamnosus* GR-1 and *Lactobacillus reuteri* RC-14 have shown effectiveness in preventing recurrent UTIs by colonizing the vaginal flora, creating a barrier against uropathogen ascension, and reducing pathogenic adherence to bladder cells. (Falagas 2012)
- In a double-blind RCT involving 252 postmenopausal women with recurrent UTIs, even though *Lactobacillus rhamnosus* GR-1 and *Lactobacillus reuteri* RC-14 were less effective than antibiotics in reducing UTIs, they helped reduce antibiotic resistance, underscoring their value as a prophylactic option amidst rising resistance concerns. (Beerpot 2017)
- *Lactobacillus* strains (e.g., *L. crispatus*, *L. rhamnosus*, and *L. reuteri*) were effective in colonizing the vaginal tract and preventing the ascension of uropathogens into the

bladder. This mechanism reduced UTI recurrence rates in women and was of particular value when combined with standard therapies. (Stapleton 2012)

- A randomized controlled trial found that *L. crispatus* significantly reduced the incidence of recurrent UTIs in women, with a 50% decrease compared to placebo. Intravaginal delivery is particularly effective in women with recurrent UTIs, as it promotes sustained colonization in the genitourinary tract. (Stapleton 2011)
- Probiotics and microbiome-friendly treatments preserve beneficial microbes, enhancing resilience against infections. (Nausch 2022)

## Uva ursi (*Arctostaphylos uva-ursi*)

### Uva ursi (*Arctostaphylos uva-ursi*)

**420–600 mg of uva ursi extract daily, divided into three doses (140–220 mg per dose)**

- Arbutin, the primary active compound in uva ursi, is metabolized in the gastrointestinal tract and kidneys into hydroquinone, which has antiseptic properties. Hydroquinone acts as a bacteriostatic and bactericidal agent against common pathogens such as *E. coli*. (Schindler 2002)
- Uva ursi shows promising efficacy in treating lower urinary tract infections, in particular in reducing bacterial counts and symptom severity, especially as a complementary therapy to antibiotics. (Gágyor 2020)
- In vitro studies show that uva ursi has an anti-inflammatory benefit that may help alleviate discomfort during infections when used as adjunctive treatment. The anti-inflammatory activity is attributed to its tannins and polyphenols, which reduce cytokine production and oxidative stress. (Kosalec 2008)

## Berberine

### Berberine

**500 mg 2–3 times daily**

Treatment duration typically ranges from two weeks for acute infections to 12 weeks for chronic or recurrent UTIs.

- Berberine exhibits broad-spectrum antimicrobial activity, including efficacy against *E. coli*, the most common UTI pathogen. (Sun 2021)
- In vitro studies confirm that berberine enhances the efficacy of antibiotics by disrupting biofilms, which protect bacteria like *E. coli* in chronic or recurrent infections. It has also been found to act as an efflux pump inhibitor, improving antibiotic susceptibility. (Li 2023)

- The evidence suggests that berberine can support gut microbiome changes that indirectly reduce UTI recurrence. It achieves this by promoting beneficial bacteria, reducing uropathogenic reservoirs, enhancing gut barrier integrity, and modulating inflammation. While direct studies linking berberine's microbiome effects specifically to UTI reduction are limited, its broader impacts on gut health and infection resistance provide promising insights. (Majeed 2022)

## Vitamin C

# Immune-supporting ingredients

**Consideration:** While there's limited evidence directly linking immune-boosting ingredients like vitamin C and zinc to UTI prevention, their general role in supporting the immune system could be highlighted as a supplemental strategy for reducing infection risk.

## Vitamin C

### 500–1,000 mg daily to support immune function

- Vitamin C enhances the immune system by promoting the function of white blood cells and supporting epithelial barriers, which may reduce infection risk in general. (Gombart 2020)

## Zinc

## Zinc

### 15–30 mg daily

- Zinc deficiency is known to impact immune function and increase susceptibility to infection. There's some evidence that children with UTIs had significantly lower serum zinc levels compared to healthy controls. Zinc deficiency was associated with an increased risk of developing UTIs, highlighting its potential role in susceptibility and prevention. (Zabihi 2020)
- A broader review on micronutrients suggested that zinc, along with other vitamins, could assist in reducing the frequency and severity of UTIs in children, though direct evidence on zinc supplementation alone was limited. (Gao 2023)

**Note:** These ingredients support overall immune health, but there's limited direct evidence for UTI prevention or treatment.

## Corn silk

# Urinary tract demulcents (symptom relief)

**Consideration:** Demulcent herbs like corn silk may alleviate urinary discomfort during active infections by soothing mucosal membranes.

## Corn silk (*Zea mays*)

**2–3 cups of tea daily or 5 mL tincture, 2–3 times daily**

- Corn silk is traditionally used for treating urinary-related issues due to its diuretic, anti-inflammatory, and soothing properties. Its bioactive compounds, such as flavonoids and terpenoids, contribute to these effects. (Hasanudin 2012)
- While this herb has traditionally been used for symptom relief, clinical studies specific to UTI symptoms are limited.

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