

Pearls for the Diagnosis and Treatment of UTIs in Adults

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Objectives

At the conclusion of this activity, participants will be able to:

- Differentiate between uncomplicated and complicated cystitis
- Select the appropriate antibiotics for treatment of cystitis and pyelonephritis
- Utilize techniques to reduce the risk of recurrent UTI
- Evaluate UTI in special populations, such as during pregnancy and in men

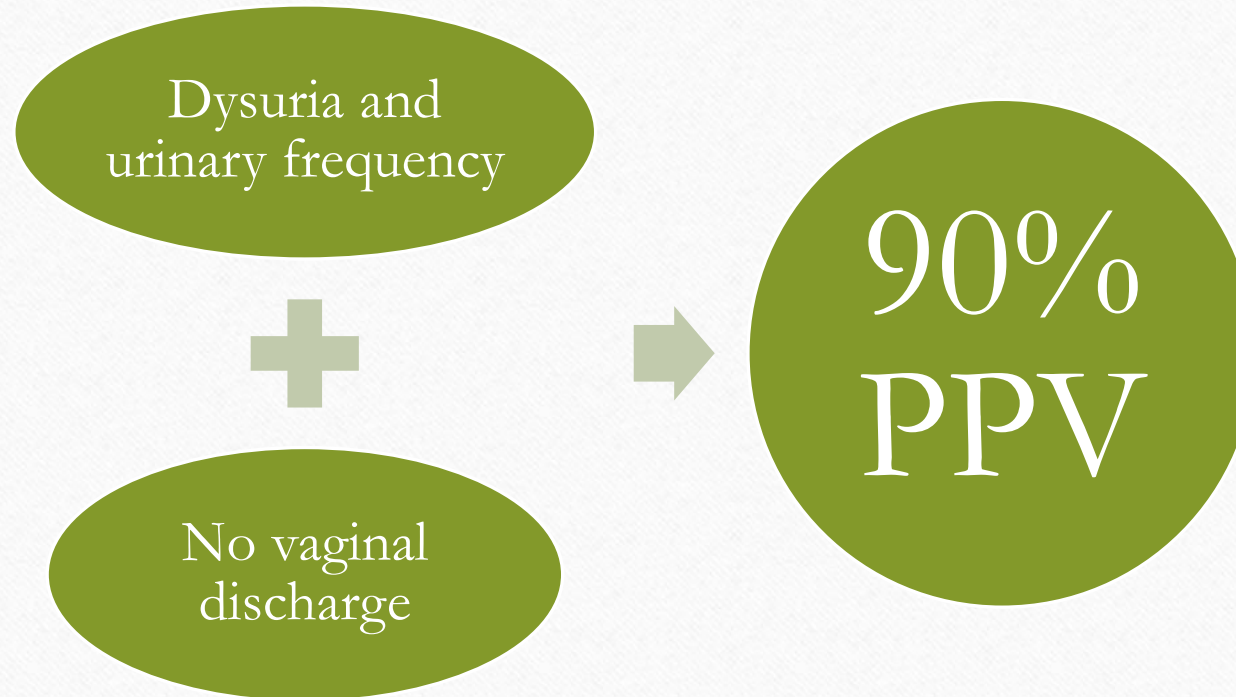
Types of UTI

- Uncomplicated cystitis
- Complicated cystitis
- Uncomplicated pyelonephritis
- Complicated pyelonephritis
- Recurrent UTI
- Asymptomatic bacteriuria

Congratulations on having enough sex to get a UTI

* In addition to frequent sexual activity, risk factors include female sex, older age, decreased estrogen levels, incontinence, catheterization, family history, immunocompromised status

Diagnose acute cystitis based on history



Do not routinely perform a urine culture to diagnose cystitis

- Prescribe treatment without lab testing
- Always send urine culture in pregnant women and in men

Distinguish between complicated and uncomplicated cystitis

- Complicated cystitis is associated with factors that increase the risk of serious outcomes or decrease the effectiveness of treatment

Table 1. Complicating Factors

- Uncontrolled diabetes mellitus
- Immunosuppression
- Urologic structural / functional abnormality
- Concurrent nephrolithiasis
- Catheter use
- Pregnancy
- Male

Prescribe nitrofurantoin as 1st line antibiotic for
cystitis

Uncomplicated

First Line:

Nitrofurantoin² 100 mg twice daily x 5 days

Second Line:

TMP/SMX DS twice daily x 3 days

Cephalexin 500 mg twice daily x 3 - 7 days

Fosfomycin 3 g x 1 dose

Prescribe nitrofurantoin as 1st line antibiotic for
cystitis

Complicated

First Line:

Nitrofurantoin 100 mg **twice** daily x 7 days

Second Line:

TMP/SMX DS twice daily x 7 days

Cephalexin 500 mg twice daily x 7 days

Fosfomycin 3 g every 48 hours for 3 doses

Do not use fluoroquinolones to treat cystitis

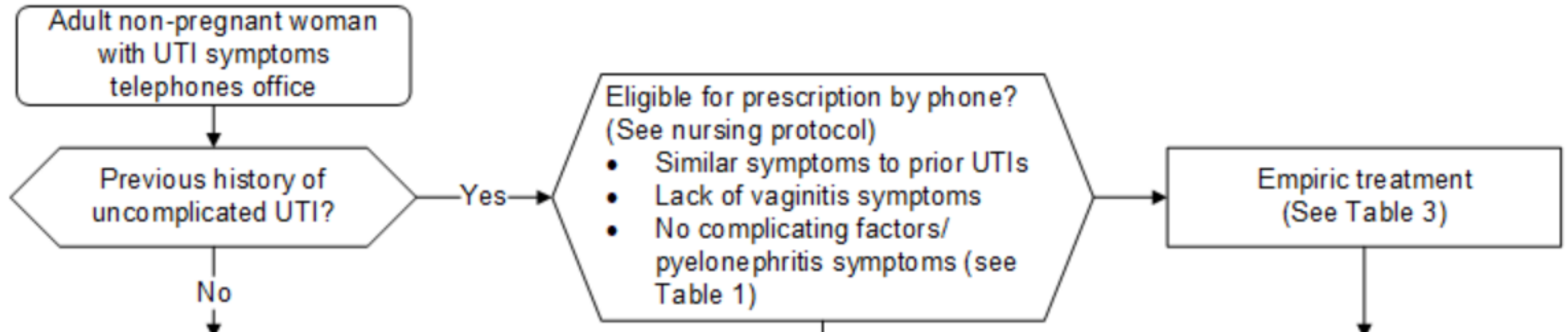
Treat cystitis with short course of antibiotic

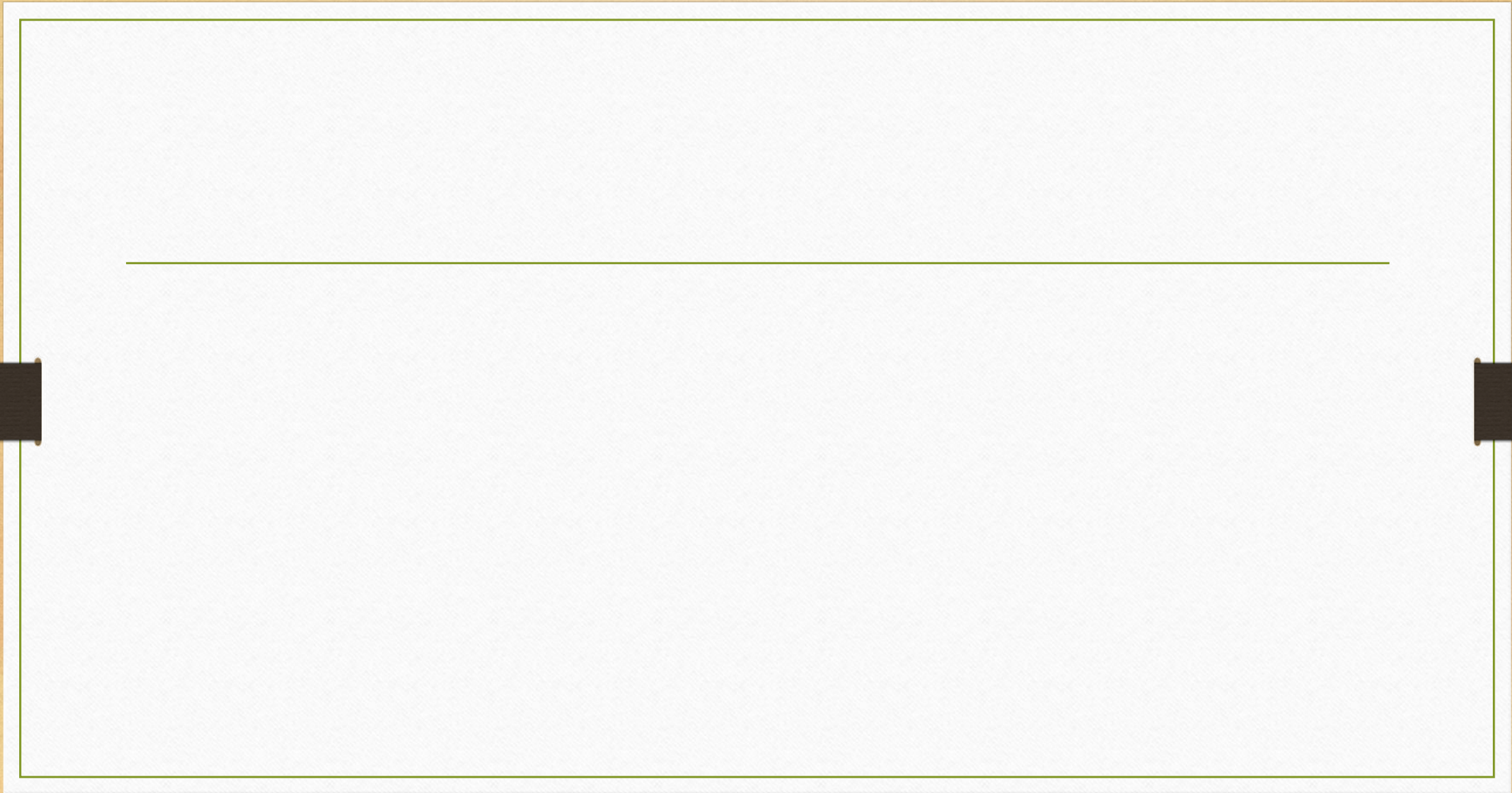
- Short courses are as effective as longer courses, with fewer side effects
- Single dose of fosfomycin may be less effective than 3-5 day antibiotic courses
- Recommended duration for treatment with beta-lactam is unclear

Prescribe a longer course of antibiotic for complicated cystitis

- Send pretreatment urine culture with sensitivity
- Consider evaluation for a structural abnormality

Consider use of telephone triage for nonpregnant women with history of uncomplicated cystitis





Diagnose pyelonephritis based on symptoms plus urinalysis

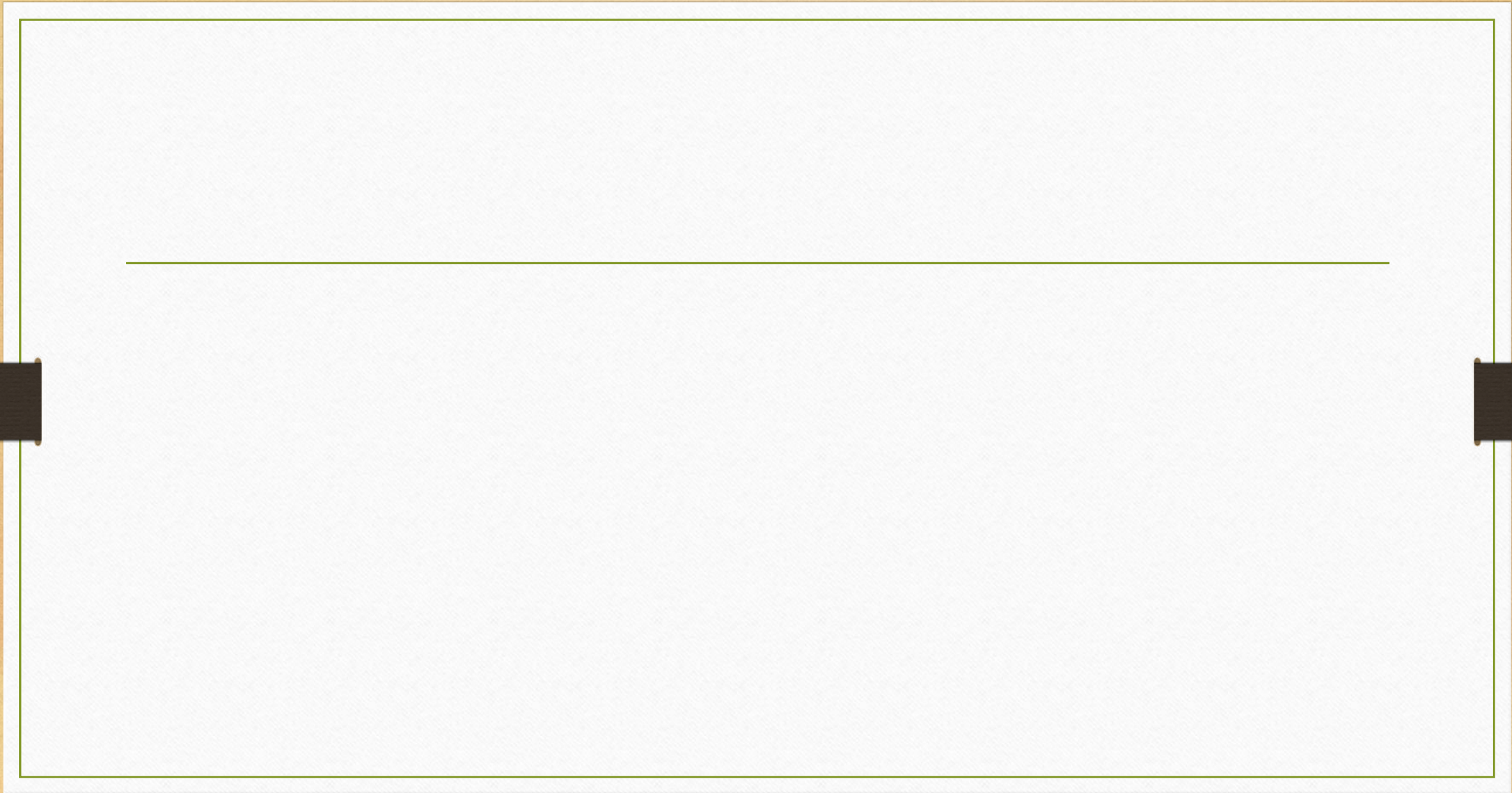
- Symptoms include cystitis plus acute flank pain
- Urinalysis indicates bacteriuria or pyuria
- Always send pretreatment urine culture with sensitivities

Do not perform imaging in uncomplicated pyelonephritis

- Order CT with and without IV contrast in complicated pyelonephritis or when infection does not respond within 48-72 hours of antibiotics
- Consider US or MRI for diagnosis in pregnant women

Treat pyelonephritis with oral antibiotics preceded by a dose of IM/IV antibiotic

Medication	Cost ¹	
	Brand	Generic
Ceftriaxone 1 g IM or IV x 1 dose*, followed by:	\$46	\$8
First Line: TMP/SMX DS twice daily x 7-14 days	\$40-80	\$6
Second Line: Ciprofloxacin 500 mg twice daily x 7 days	\$87	\$6
Levofloxacin 750 mg once daily x 5 days	\$162	\$6
Third Line Amoxicillin/clavulanate 875/125 mg 2 x daily x 10-14 days	\$76	\$13



Most recurrent UTIs occur in healthy women with normal urologic anatomy

- Risk factors for recurrent UTIs include: frequent sex, new sex partners, spermicide use, h/o UTI <15 years old, estrogen deficiency, urinary retention
- No evidence of decreased risk of UTIs with wiping front to back, wearing cotton underwear, douching, postcoital urination

Obtain urine culture with recurrent UTI

- Reinfection causes most rUTIs
- Reinfection typically occurs at least 2 weeks after treatment and is caused by a different organism
- In relapse, the bacteriuria persists during treatment

Do not order imaging in patients with recurrent UTI

- Measure postvoid residual in men and postmenopausal women with rUTI
- Consider imaging in patients with hematuria persisting after resolution of UTI, h/o urinary tract malignancy, h/o urinary tract surgery, MDRO, repeat pyelonephritis

Counsel about modifying risk factors for recurrent UTI

Encourage premenopausal women with recurrent UTI to drink water

- Drinking 1.5 L of additional water per day reduces risk of rUTI

Offer vaginal estrogen to postmenopausal women with recurrent UTIs

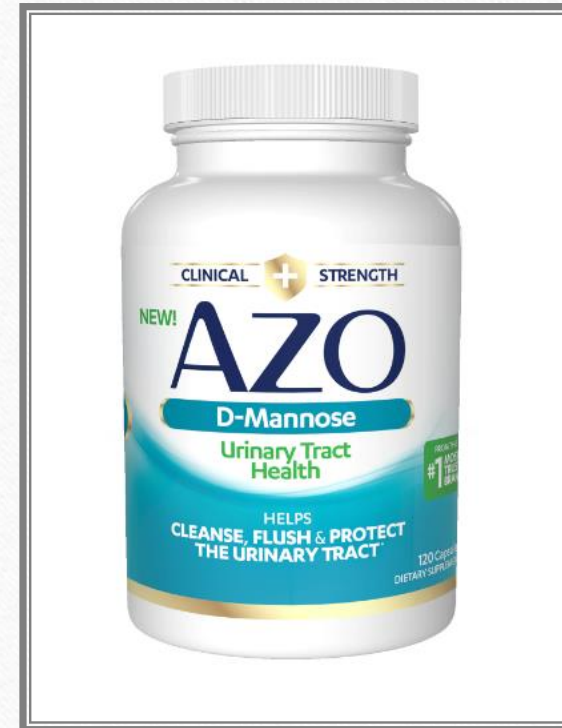
- Low estrogen levels lead to an increase in vaginal pH, enabling growth of uropathogens

Do not recommend cranberry products to reduce risk of recurrent UTI

- Cranberries contain proanthocyanidins which theoretically prevent *E. coli* from adhering to uroepithelial cells
- Poor quality studies show conflicting results

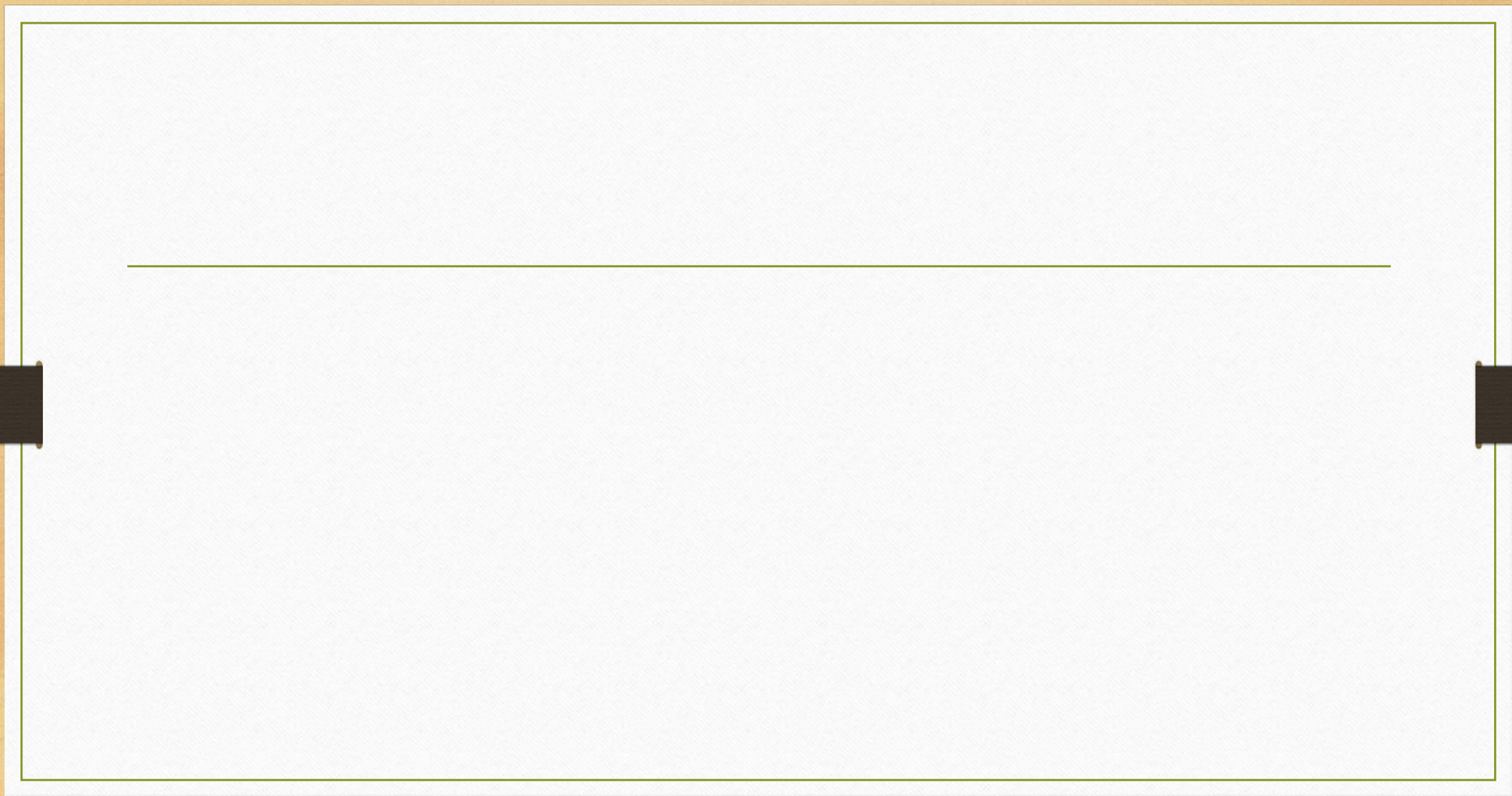
Consider use of oral D-mannose to reduce risk of recurrent UTI

- Inhibits bacterial adhesion to the urothelium
- 200 ml of 1% solution daily



Consider antibiotic prophylaxis for recurrent UTI

- Prescribe daily or postcoital antibiotic: nitrofurantoin 50-100 mg qhs, or TMP/SMX SS 80/400 mg daily for up to 6 months
- Prescribe self-initiated therapy



Screen for and treat asymptomatic bacteriuria in pregnant women

- Send urine culture at initial prenatal visit
- Treat bacteriuria or cystitis with nitrofurantoin or cephalexin for 7 days
- Hospitalize pregnant women with pyelonephritis
- Avoid fluoroquinolones in pregnancy

Obtain STI testing and send culture in men with UTI

- Obtain initial void urine for STI testing in men 14-35 years old and those who are at risk for STI
- Send urine culture in all men
- Measure bladder postvoid residual volume

Treat cystitis in men in a similar manner as women with cystitis

- Treat cystitis with nitrofurantoin
- Choose TMP/SMX or a fluoroquinolone when concerned about prostatitis
- Decompress acute urinary retention with catheterization
- Manage urinary retention with an alpha blocker

Diagnose and treat UTI in patients >65 years the same as younger patients

- Nonspecific symptoms do not predictably correlate to UTIs
- Diagnosis (in non-catheterized patients) requires localizing GU or infectious symptoms along with bacteriuria
- Use nitrofurantoin if $\text{GFR} > 30 \text{ ml/min}$
- Do not treat asymptomatic bacteriuria
- Do not obtain follow up urinalysis or culture

References & Resources

- https://www.med.umich.edu/asp/pdf/adult_guidelines/UTI_ADULT.pdf
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