Urology birmingham CENTERS OF ALABAMA

Don’t Just Give ‘em Antibiotics! A Simple Way to Diagnose and Treat UTI's

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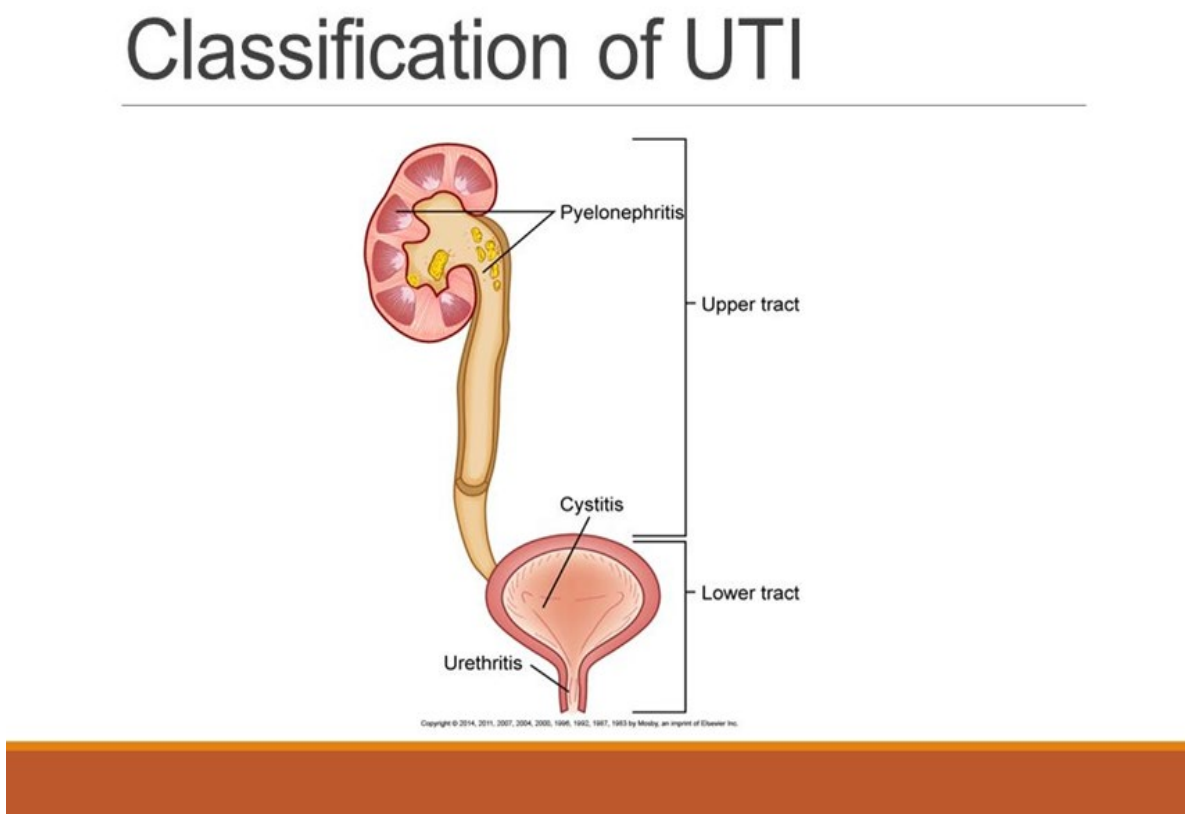
What is a UTI?



Pathophysiology

- 3 routes
  - Ascending due to inoculation of urethra with bowel flora
  - Hematogenous spread from kidney
  - Lymphatic spread
- Uncommon pathogens more likely in special populations
  - Diabetes, structural abnormalities, indwelling catheter

Epidemiology

- Most common organism:
  - E. coli (75-95% of cases)
  - Klebsiella and proteus
- Incidence:
  - 7 million physician visits ***annually***
- Prevalence:
  - F>M
    - Attributed to shorter distance from urethra to anus
    - Females: 53 per 100 lifetime prevalence
    - Males: 14 per 100 lifetime prevalence

Risk Factors

- Female
  - Sexual intercourse
  - History of UTI
  - Use of spermatocides, diaphragms, and spermicides
- Comorbidities
  - Diabetes
  - Structural abnormalities

Diagnosis of UTI

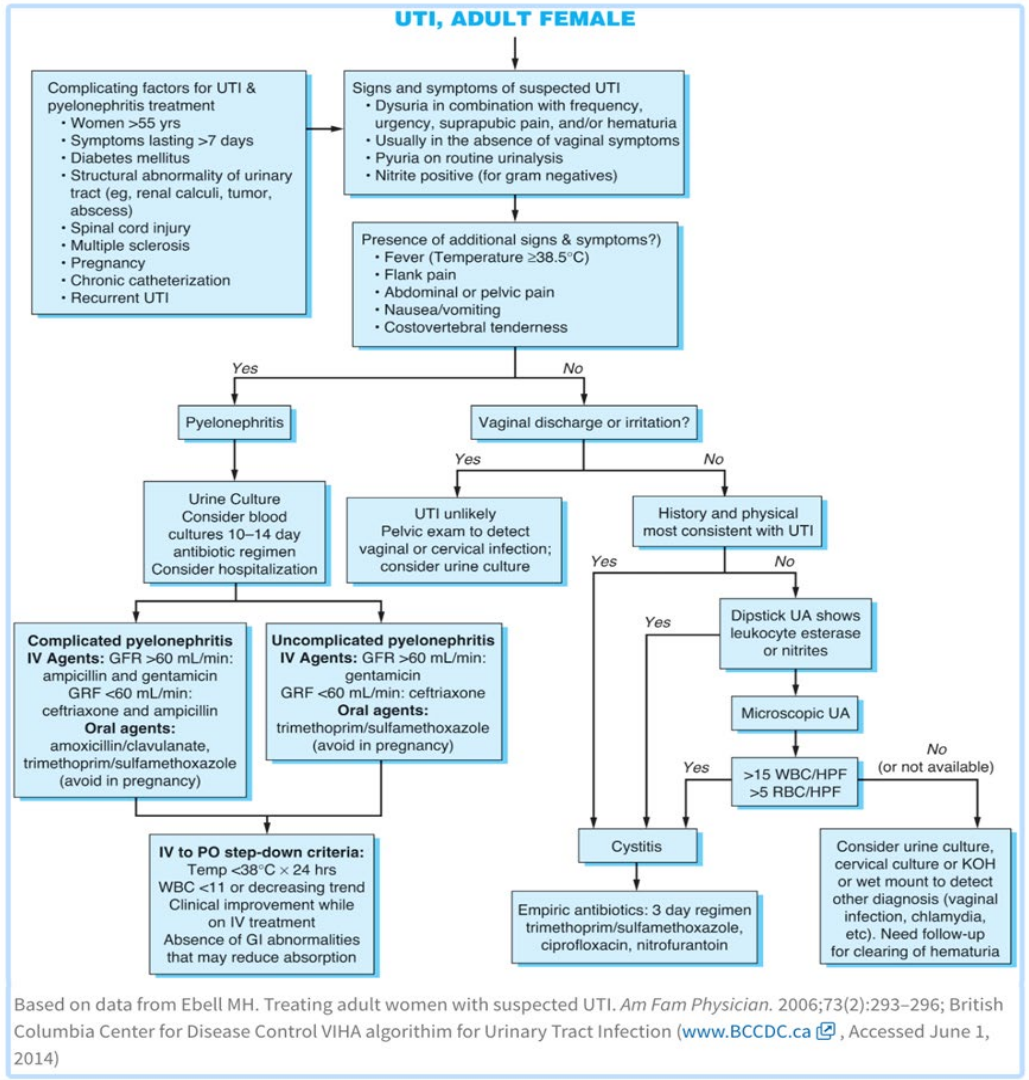
- History
  - Dysuria, frequency, hematuria (gross/microscopic), AMS in elderly
- Physical
  - +/- flank pain, suprapubic pain
- UA findings suggestive of UTI
  - (+) Leukocyte esterase
  - (+) nitrites
  - (+) bacteria
- Definitive diagnosis requires **urine culture**
  - > 100K colonies/mL on urine culture is considered diagnostic for UTI

Table 1. Urinalysis Results

Test	Usual Range	Indicators of Infection	Accuracy
Bacteria	Absent	Any amount	Low sensitivity,[a] high specificity[b]
Leukocyte esterase	Absent	Positive = pyuria, presence of WBCs in urine	High sensitivity, low specificity
WBC	<5	Pyuria: WBC >10	High sensitivity, low specificity
Nitrite	Absent	Positive = presence of bacteria that reduce nitrate	Low sensitivity, high specificity
RBC	<5	Hematuria common in infection	Low sensitivity, high specificity
Epithelial cells	<5	<5 = good urine sample	High epithelial cells indicate contamination with skin flora
pH	4.5-8	pH ↑ if urea-splitting organism (e.g., *Proteus mirabilis*) is present	Low specificity (there are many other causes of alkaline urine)

[a] *Sensitivity = likelihood of positive test when disease is present.*
[b] *Specificity = likelihood of negative test when disease is not present.*
Source: Reference 1.

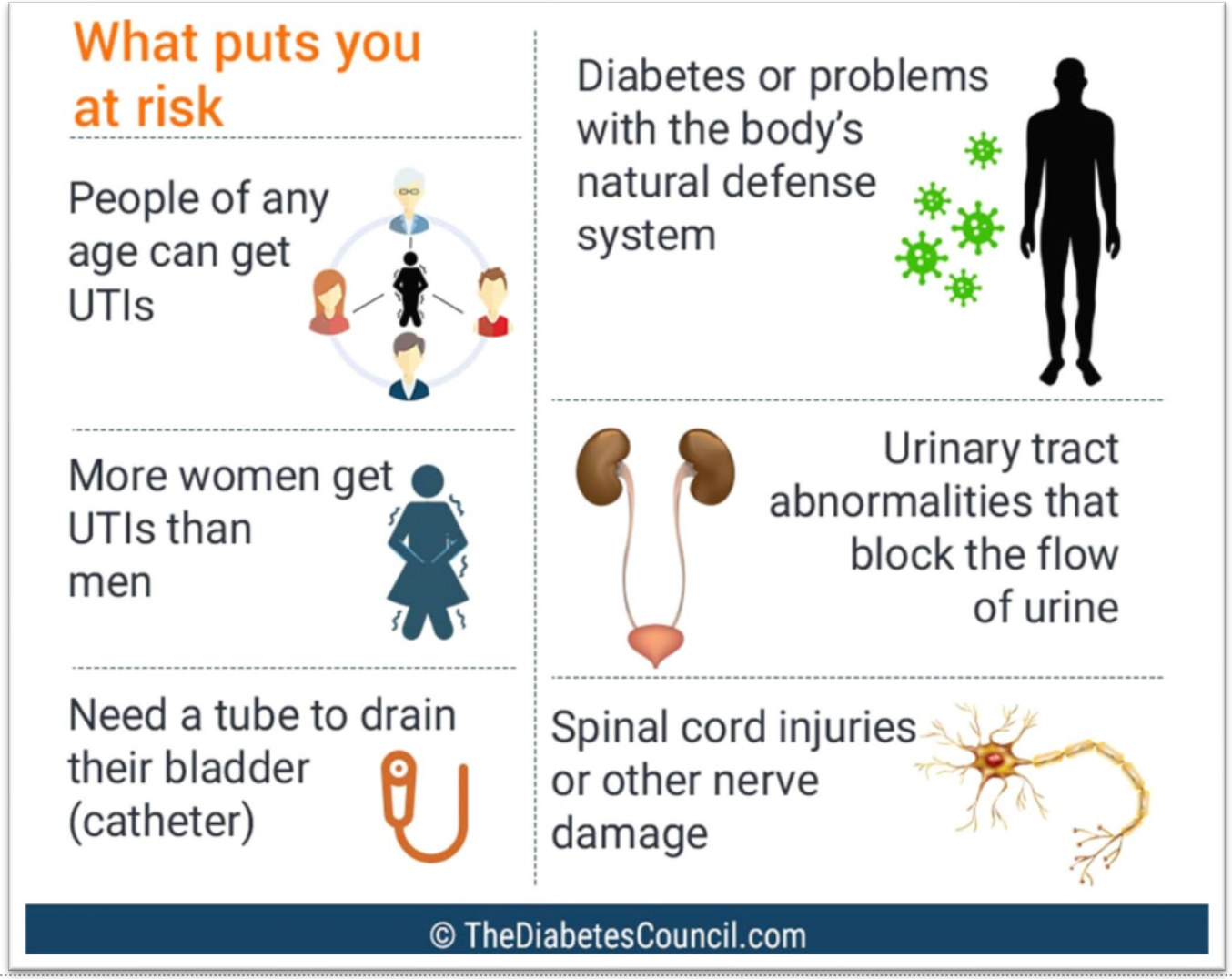
Female UTI Algorithm



Based on data from Ebell MH. Treating adult women with suspected UTI. *Am Fam Physician.* 2006;73(2):293–296; British Columbia Center for Disease Control VIHA algorithim for Urinary Tract Infection (www.BCCDC.ca , Accessed June 1, 2014)

Complicated vs. Uncomplicated

- Uncomplicated UTI
  - Females
- Complicated UTI
  - Immunosuppressed
  - Pregnant
  - SCI
  - Male
  - Pediatric
  - Chronic foley catheter, ureteral stent
  - Urinary tract structural abnormalities
  - Stones
  - Renal insufficiency



Dysuria: How to know it's a true infection

Bacterial Cystitis

- Symptoms:
  - Fever
  - Chills
  - Flank pain
- Positive UA and positive UCX

Non-bacterial/Interstitial cystitis (IC)

- Symptoms:
  - Pelvic pain
  - Dysuria
  - Frequency, urgency
- Associated with stress or dietary changes
- Negative UA and negative UCX

Male UTI

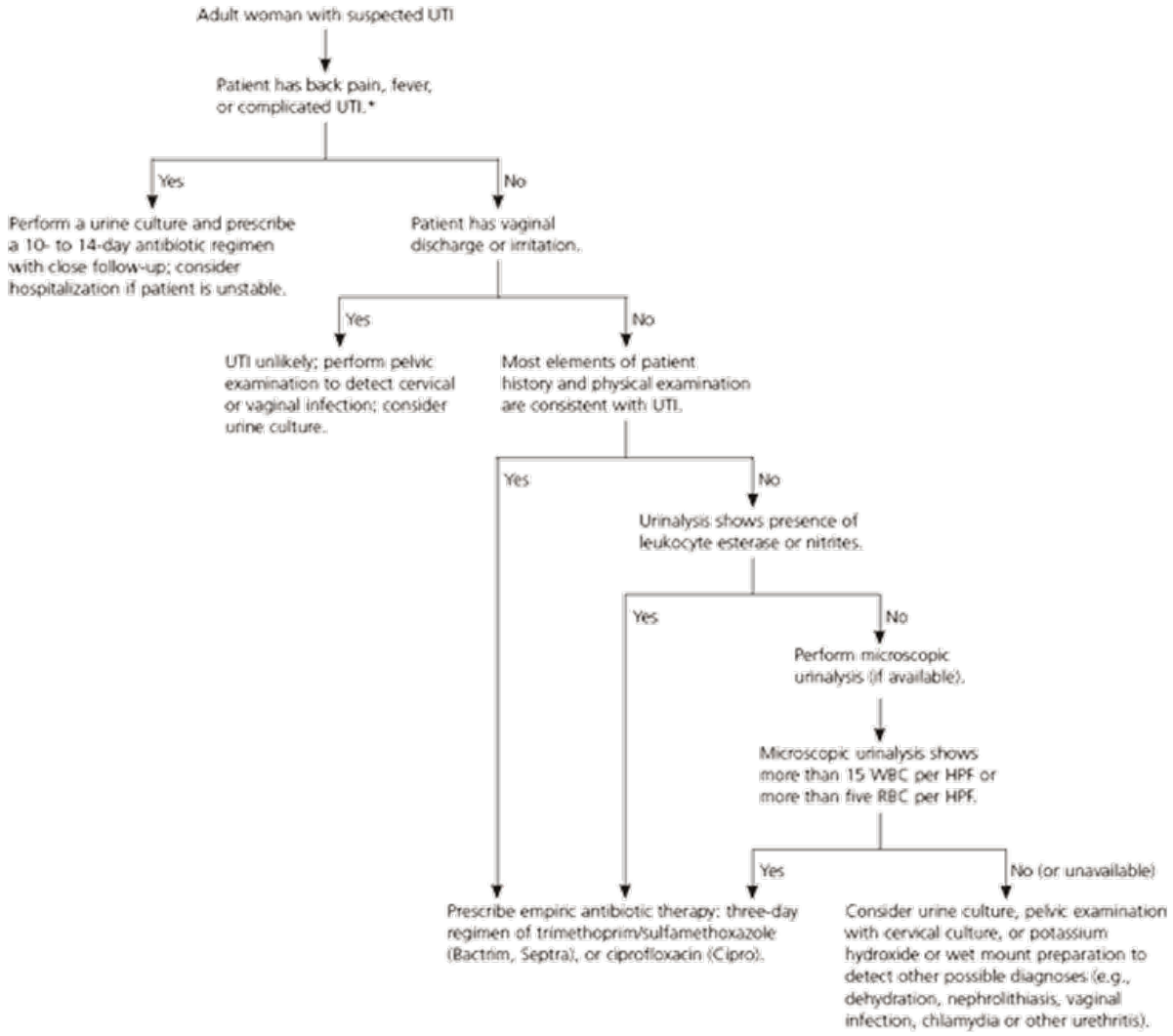
- Always requires a workup
- Risk factors:
  - BPH
  - Prostatitis
  - Neurogenic bladder
  - Kidney/bladder stones
- Uncircumcised could lead to false positive UA dipstick
  - Always get clean catch AND culture if high level of suspicion for UTI

Recurrent UTI

- ≥ 2 infections in 6 months OR ≥ 3 in 1 year
- Workup
  - CT A/P to rule out anatomic abnormalities or stones
  - Pelvic exam for females
  - Cystoscopy
  - Urine culture
- Treatments
  - Post-coital antibiotics
  - Low dose daily suppression
  - Vaginal estrogen creams (postmenopausal women)
  - Hydration
  - Frequent voiding

When to prescribe antibiotics

- Patient with signs and symptoms of UTI
- Positive UA dipstick and/or urine culture
- Patients with other comorbidities



Antibiotic Stewardship

- Antibiotic resistance is widely increasing across the board

Condition	Epidemiology	Diagnosis	Management
Acute uncomplicated cystitis[10,11]	• Cystitis is among the most common infections in women and is usually caused by *E. coli*.	• Classic symptoms include dysuria, frequent voiding of small volumes, and urinary urgency. Hematuria and suprapubic discomfort are less common. • Nitrites and leukocyte esterase are the most accurate indicators of acute uncomplicated cystitis	For acute uncomplicated cysti healthy adult non-pregnant, premenopausal women: • Nitrofurantoin, trimethoprim/sulfametho (TMP-SMX, where local resistance is <20%), and fosfomycin are appropria first-line agents. • Fluoroquinolones (e.g. ciprofloxacin) should be reserved for situations in other agents are not appropriate.

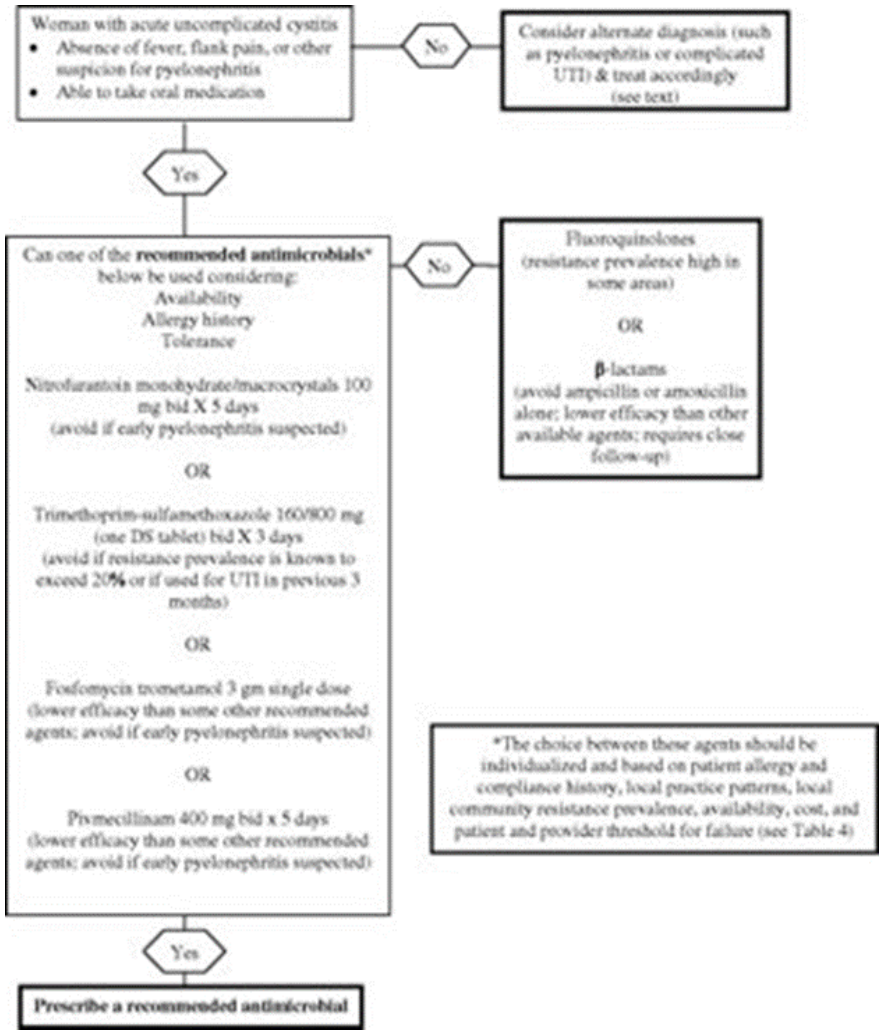
Multidrug Resistant UTI

COLONY COUNT

		PSEUD AERU M.I.C.	RX
	MEROPENEM		S
	AMIKACIN		S
	CEFAZOLIN		R
*	CIPROFLOXACIN		R
*	CEFEPIME		S
*	CEFOTAXIME		R
	CEFTAZIDIME		I
	CEFTRIAXONE		R
	GENTAMICIN		S
	LEVOFLOXACIN		R
*	PIPERACILLIN		S
	TOBRAMYCIN		S
*	PIPERACIL/TAZOB		S
	TICARCILLIN-NON		R

Empiric Therapy

- Empiric therapy in patients not at risk for MDR organisms
  - Nitrofurantoin (Macrobid)
  - TMP-SMZ (Bactrim)
  - Fosfomycin
- Empiric therapy in patients at risk for MDR organisms
  - Fluroquinolones (ie. Cipro, Levaquin)
  - Broad spectrum beta-lactams (ie. Third or later cephalosporins)
- Culture directed therapy



Prevention is Key

Conclusive

- Hygiene
- Hydration
- Sterile technique during catheterization
- Avoiding overtreatment of asymptomatic pyuria or bacteruria
- Void after intercourse

Nonconclusive

- Avoid douching, tampons, IUDs
- Cranberry supplements

What Constitutes Referral?

- Complicated UTI
- Obstructing kidney stones
- Recurrent Complicated UTI
- Relapsing infection
- Gross hematuria
- Interstitial (non-bacterial) cystitis

THANK YOU

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UCA | WOMEN'S CENTER

Resources

- The 5-minute urology consult (Gomella et.al)
- Pocket guide to urology (Wieder)
- CDC
- Uptodate (https://www.uptodate.com/contents/acute-simple-cystitis-in-women)
- https://www.auanet.org/education/auauniversity/for-medical-students/medical-student-curriculum/adult-uti