South Dakota Department of Health

Approach to Urinary Tract Infection Diagnosis and Treatment

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Keegan Mason & Associates, LLC

Consulting Team

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*No Disclosures

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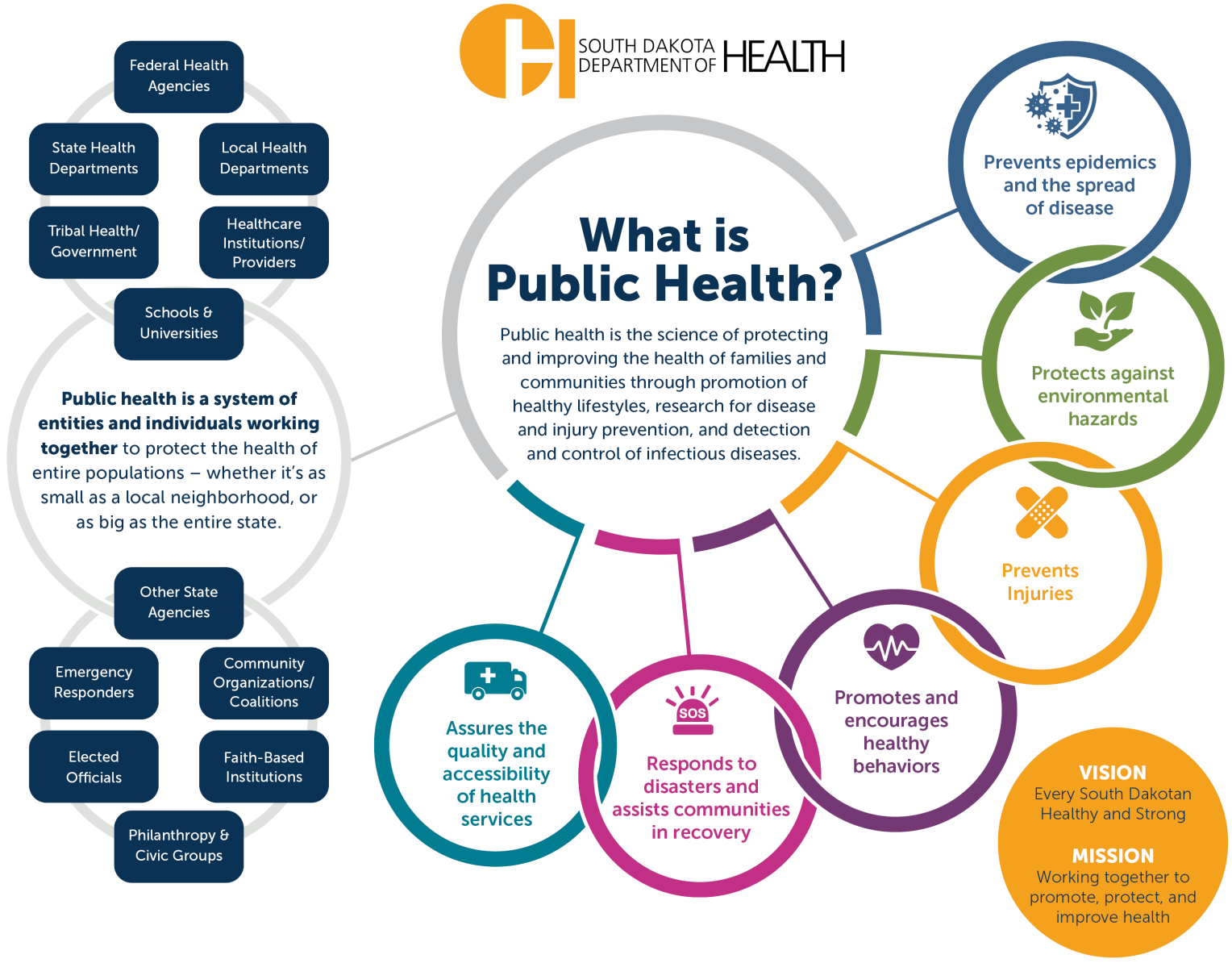

SOUTH DAKOTA DEPARTMENT OF HEALTH
Federal Health Agencies
State Health Departments
Local Health Departments
Tribal Health/ Government
Healthcare Institutions/ Providers
Schools & Universities
Public health is a system of entities and individuals working together to protect the health of entire populations – whether it's as small as a local neighborhood, or as big as the entire state.
Other State Agencies
Emergency Responders
Community Organizations/ Coalitions
Elected Officials
Faith-Based Institutions
Philanthropy & Civic Groups
What is Public Health?
Public health is the science of protecting and improving the health of families and communities through promotion of healthy lifestyles, research for disease and injury prevention, and detection and control of infectious diseases.
Prevents epidemics and the spread of disease
Protects against environmental hazards
Prevents Injuries
Promotes and encourages healthy behaviors
Responds to disasters and assists communities in recovery
SOS
Assures the quality and accessibility of health services
VISION
Every South Dakotan Healthy and Strong
MISSION
Working together to promote, protect, and improve health

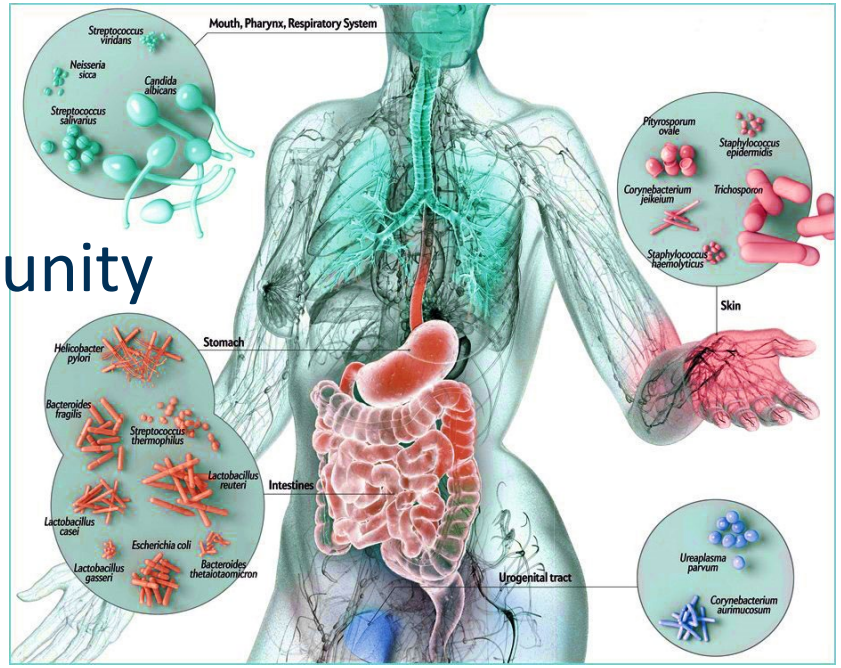
Learning Objectives

- Identify developments and challenges in the clinical diagnosis of urinary tract infections.
- Describe current guideline-based treatment approaches for urinary tract infections.
- Explain the role of the urinary microbiome in the diagnosis and treatment of urinary tract infections

Antibiotic Stewardship includes Diagnostic Stewardship

- Test Result leads to action or treatment
  - Inclined to use Order Sets or Protocols
  - Clinical Assessment/Critical Thinking Opportunity

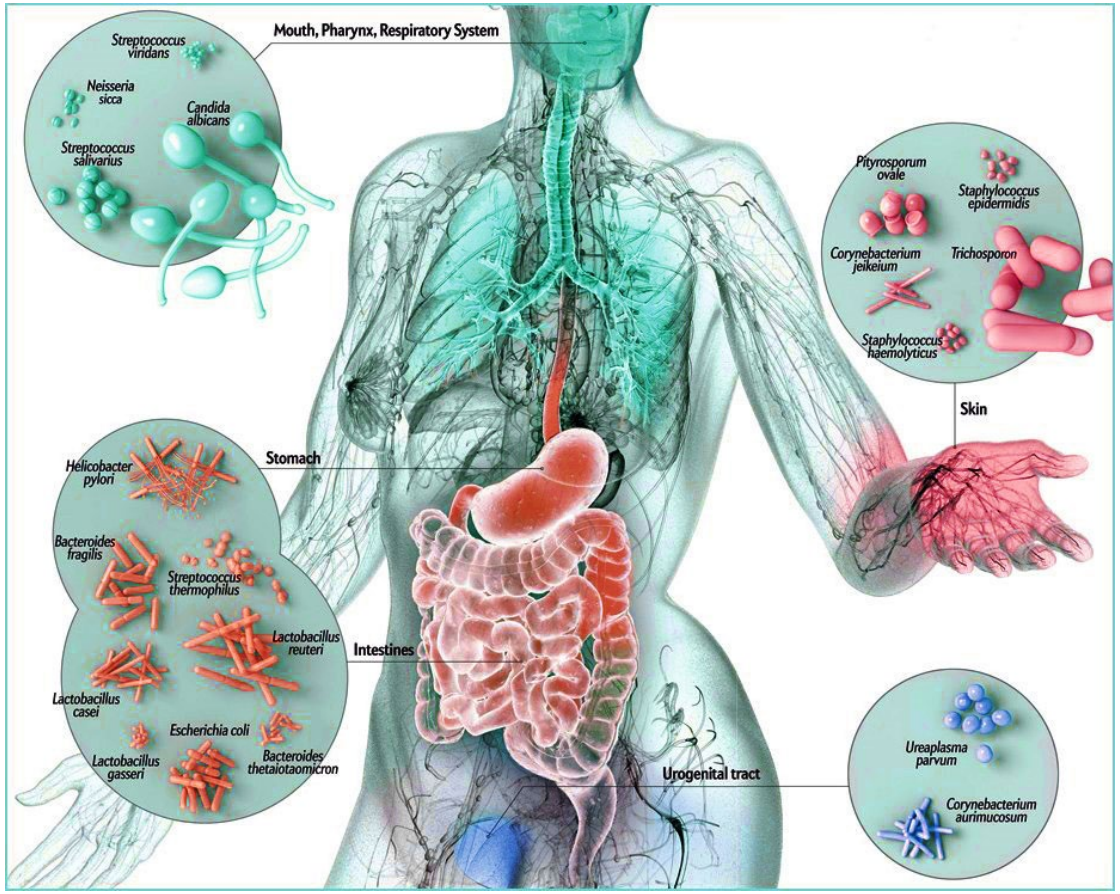
- Clinical examples



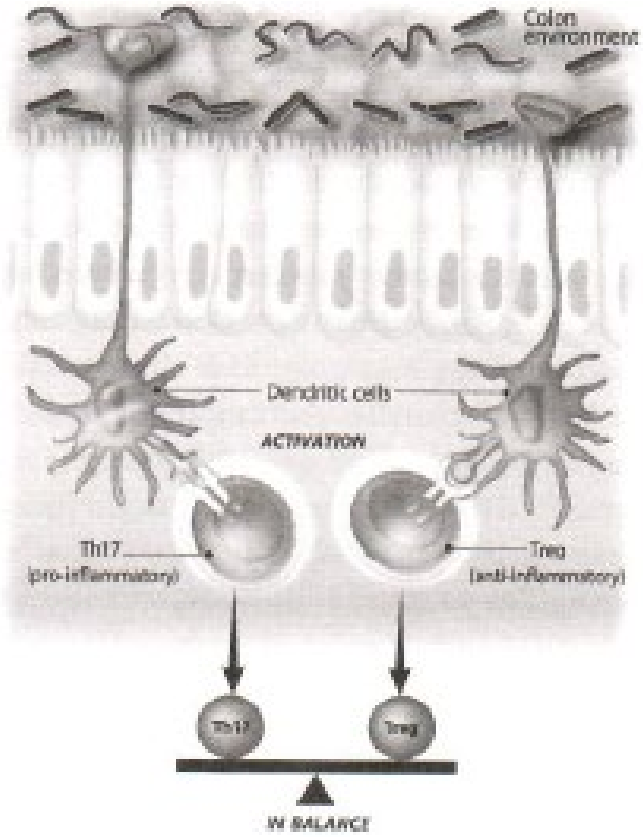
Microbiome Considerations

- Normal genitourinary flora
- Normal vaginal flora
- Atrophic vaginitis flora

Treatment increases risk of UTI’s



Human Microbiome



Balancing Inflammation. The gut microbiota influence the balance of pro-inflammatory Th17 cells and anti-inflammatory Tregs.

The mechanisms and molecules underlying the interactions of segmented filamentous bacteria with the immune system remain incompletely understood, as does their ability to avoid triggering the tissue-damaging inflammation that pathogens can cause. Researchers suspect that segmented filamentous bacteria may be prompting a different type of Th17 cell, one that acts more like a subtle tonic than a flame-thrower. It's also possible the segmented filamentous bacteria stimulate Tregs to produce cytokines that counterbalance the pro-inflammatory cytokines that the TH17 cell secrete, thereby keeping the latter below tissue damaging levels.

Diagnostic Considerations

Asymptomatic Bacteriuria

Asymptomatic Bacteriuria (ASB)

- The presence of significant colony counts of bacteria in the urine from a person without symptoms of a UTI.
- ASB does not indicate a UTI.
- Urine cultures should only be obtained from patients with symptoms of a UTI.
- Urine from patients with ASB may contain white blood cells (WBC)—their presence also does not indicate a UTI in the absence of urinary symptoms

Mental Status Changes and Asymptomatic Bacteriuria

- Bacteriuria and delirium are each independently common in the elderly.
- Although patients with a symptomatic UTI may present with delirium, falls, or confusion, these symptoms are unlikely to be the result of a UTI in the absence of urinary symptoms.
- If a patient has signs of systemic infection and delirium, empiric antibiotic therapy is likely warranted.

Asymptomatic Bacteriuria (ASB)

ASB is **COMMON**.

Population	Prevalence
Healthy premenopausal women	1–5%
Women 65–90 years old	11–16%
Female long-term care residents	25–50%
Male long-term care residents	15–50%
Women with diabetes	9–27%
Men with diabetes	1–11%
People receiving hemodialysis	25%
People with indwelling urinary catheters	> 90%

Asymptomatic Pyuria

- Pyuria is also **COMMON**.

Population	Prevalence
Young women	32%
Pregnant women	30-70%
Diabetic Women	70%
Elderly institutionalized patients	90%
Dialysis Patients	90%
Patients with short term catheters	1–11%
Patients with long term catheters	25%

- Pyuria in patients with Asymptomatic Bacteriuria is not an indication for antibiotic therapy
- Other causes of pyuria to consider include sexually transmitted infections and interstitial nephritis

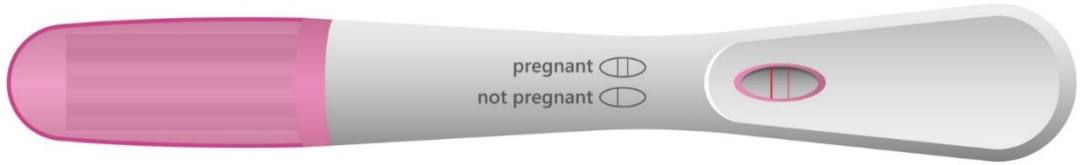
Treatment of ASB Is Not Beneficial And May Cause *Harm*

- **ASB does not require treatment**
- Randomized controlled trials have not shown that antibiotic treatment of ASB reduces subsequent risk of UTI
- Treatment of ASB is associated with:
  - Avoidable antibiotic-associated adverse events
  - An increased risk of subsequent UTIs that may be increasingly difficult to treat due to the development of antibiotic resistance

When is Screening/Treating for ASB indicated?

Guidelines recommend screening and treating for ASB in two situations:

- Early in pregnancy
  - May prevent pyelonephritis, preterm labor, and low birth-weight infants
- Impending urologic procedure in which mucosal bleeding is expected
  - May prevent urosepsis

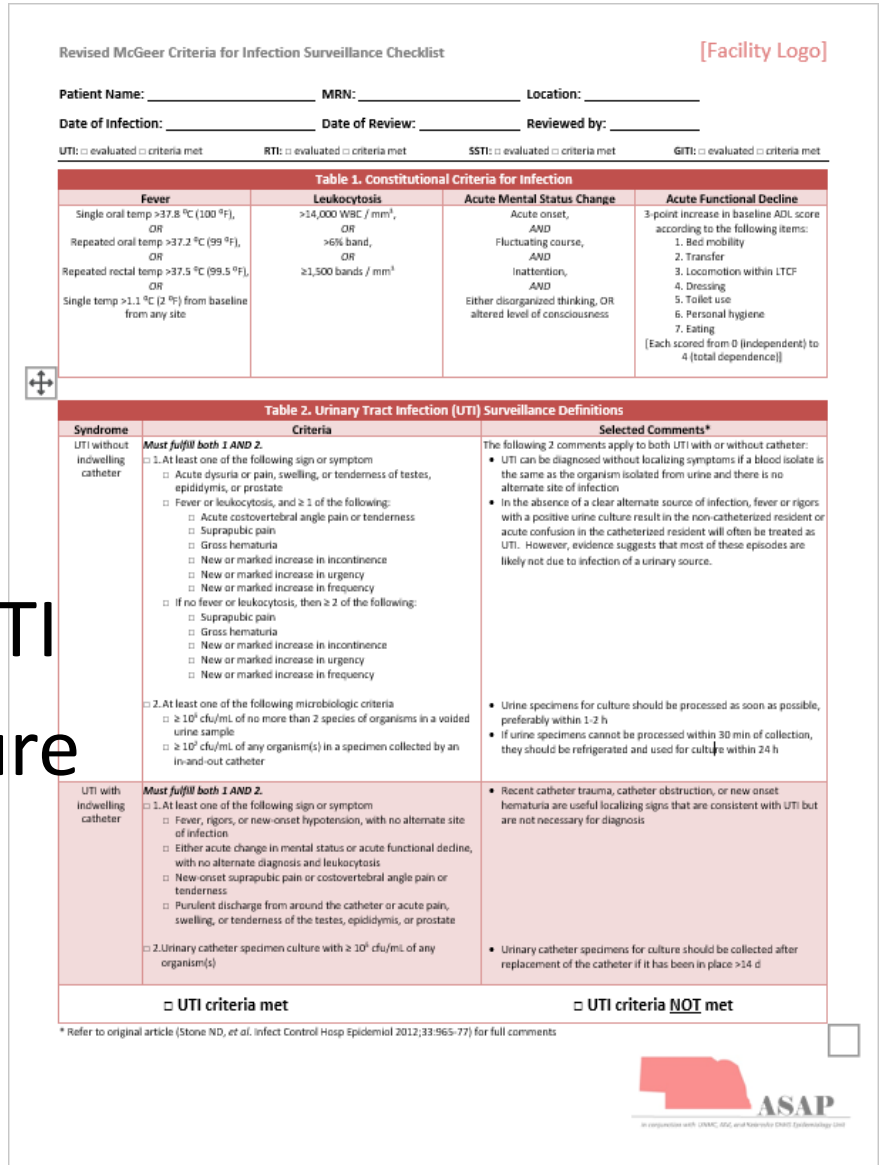


Urinalysis and Urine Cultures

- Send urinalysis (UA) and urine culture when patient has symptoms of UTI
- How urine cultures are collected matters
- Do not send urine cultures for
  - Cloudy or foul-smelling urine
  - Routinely on admission or preop
  - Routinely before or after a catheter change
  - As part of a fever work up if there are no signs or symptoms localizing to the urinary tract
  - As a test of cure

Important Considerations

- Atrophic Vaginitis
- LTC McGeer Criteria
- #1 use of antibiotics in LTC is suspected UTI
- Do not check a U/A or urine culture for cure
- Indwelling catheter colonization



Revised McGeer Criteria for Infection Surveillance Checklist [Facility Logo]

Patient Name: _____ MRN: _____ Location: _____

Date of Infection: _____ Date of Review: _____ Reviewed by: _____

UTI: □ evaluated □ criteria met RTI: □ evaluated □ criteria met SSTI: □ evaluated □ criteria met GITI: □ evaluated □ criteria met

Table 1. Constitutional Criteria for Infection

Fever	Leukocytosis	Acute Mental Status Change	Acute Functional Decline
Single oral temp >37.8 °C (100 °F), *OR* Repeated oral temp >37.2 °C (99 °F), *OR* Repeated rectal temp >37.5 °C (99.5 °F), *OR* Single temp >1.1 °C (2 °F) from baseline from any site	>14,000 WBC / mm^3, *OR* >6% band, *OR* ≥1,500 bands / mm^3	Acute onset, *AND* Fluctuating course, *AND* Inattention, *AND* Either disorganized thinking, OR altered level of consciousness	3-point increase in baseline ADL score according to the following items: 1. Bed mobility 2. Transfer 3. Locomotion within LTCF 4. Dressing 5. Toilet use 6. Personal hygiene 7. Eating [Each scored from 0 (independent) to 4 (total dependence)]

Table 2. Urinary Tract Infection (UTI) Surveillance Definitions

Syndrome	Criteria	Selected Comments*
UTI without indwelling catheter	***Must fulfill both 1 AND 2.*** □ 1. At least one of the following sign or symptom □ Acute dysuria or pain, swelling, or tenderness of testes, epididymis, or prostate □ Fever or leukocytosis, and ≥ 1 of the following: □ Acute costovertebral angle pain or tenderness □ Suprapubic pain □ Gross hematuria □ New or marked increase in incontinence □ New or marked increase in urgency □ New or marked increase in frequency □ If no fever or leukocytosis, then ≥ 2 of the following: □ Suprapubic pain □ Gross hematuria □ New or marked increase in incontinence □ New or marked increase in urgency □ New or marked increase in frequency □ 2. At least one of the following microbiologic criteria □ ≥ 10^5 cfu/mL of no more than 2 species of organisms in a voided urine sample □ ≥ 10^2 cfu/mL of any organism(s) in a specimen collected by an in-and-out catheter	The following 2 comments apply to both UTI with or without catheter: • UTI can be diagnosed without localizing symptoms if a blood isolate is the same as the organism isolated from urine and there is no alternate site of infection • In the absence of a clear alternate source of infection, fever or rigors with a positive urine culture result in the non-catheterized resident or acute confusion in the catheterized resident will often be treated as UTI. However, evidence suggests that most of these episodes are likely not due to infection of a urinary source. • Urine specimens for culture should be processed as soon as possible, preferably within 1-2 h • If urine specimens cannot be processed within 30 min of collection, they should be refrigerated and used for culture within 24 h
UTI with indwelling catheter	***Must fulfill both 1 AND 2.*** □ 1. At least one of the following sign or symptom □ Fever, rigors, or new-onset hypotension, with no alternate site of infection □ Either acute change in mental status or acute functional decline, with no alternate diagnosis and leukocytosis □ New-onset suprapubic pain or costovertebral angle pain or tenderness □ Purulent discharge from around the catheter or acute pain, swelling, or tenderness of the testes, epididymis, or prostate □ 2. Urinary catheter specimen culture with ≥ 10^5 cfu/mL of any organism(s)	• Recent catheter trauma, catheter obstruction, or new onset hematuria are useful localizing signs that are consistent with UTI but are not necessary for diagnosis • Urinary catheter specimens for culture should be collected after replacement of the catheter if it has been in place >14 d
	□ UTI criteria met	□ UTI criteria NOT met

* Refer to original article (Stone ND, *et al.* Infect Control Hosp Epidemiol 2012;33:965-77) for full comments

ASAP

Recurrent UTI's

- Consider catheter acquired urine culture
- Adequate fluid intake
- Assess and treat for atrophic vaginitis
- Cranberry juice
- Lactobacillus containing probiotic

Urine Culture Results and Sensitivities in Rural Areas

- 90% of positive urine cultures are E. coli
- Sensitivities
  - Nitrofurantoin 98%
  - Keflex 95%
  - TMP/SMP 95%

Uncomplicated Cystitis Treatment

Drug	Duration Studied
Nitrofurantoin	**5 days**
TMP/SMX	**3 days**
Cephalexin	7 days
Cefpodoxime	3 days
Cefdinir	5 days

***Most patients can be treated for 3–5 days*.**

- Back up treatment options: Ciprofloxacin and Fosfomycin

Take Home Messages

- Send urinalysis and urine cultures only when you suspect UTIs based on clinical symptoms.
- Asymptomatic bacteriuria is common and should not be treated in the vast majority of patients.
- Select appropriate durations of therapy for cystitis, pyelonephritis, and complicated urinary tract infections.
  - For uncomplicated cystitis this is generally 3–5 days.

Questions and Discussion

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Antibiotic Stewardship Awareness

Antibiotic Stewardship Awareness Month Is Coming — We Want to Feature You!

- A brief quote or insight about why stewardship matters.
- A story or example from your practice experience.
- A project or initiative you are working on related to antibiotic stewardship.

Your contributions will help us highlight best practices, inspire others and increase awareness!

Submit your stories by October 1, 2025!
cheri.fast@state.sd.us

Please complete the evaluation!

Help us plan the next educational webinar!

https://forms.office.com/g/hEbxN1wBB6

References available upon request.


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