



INFECTION MANAGEMENT AND ANTIBIOTIC STEWARDSHIP

Hot Topic Session #5: UTIs and UA challenges

June 12, 2024

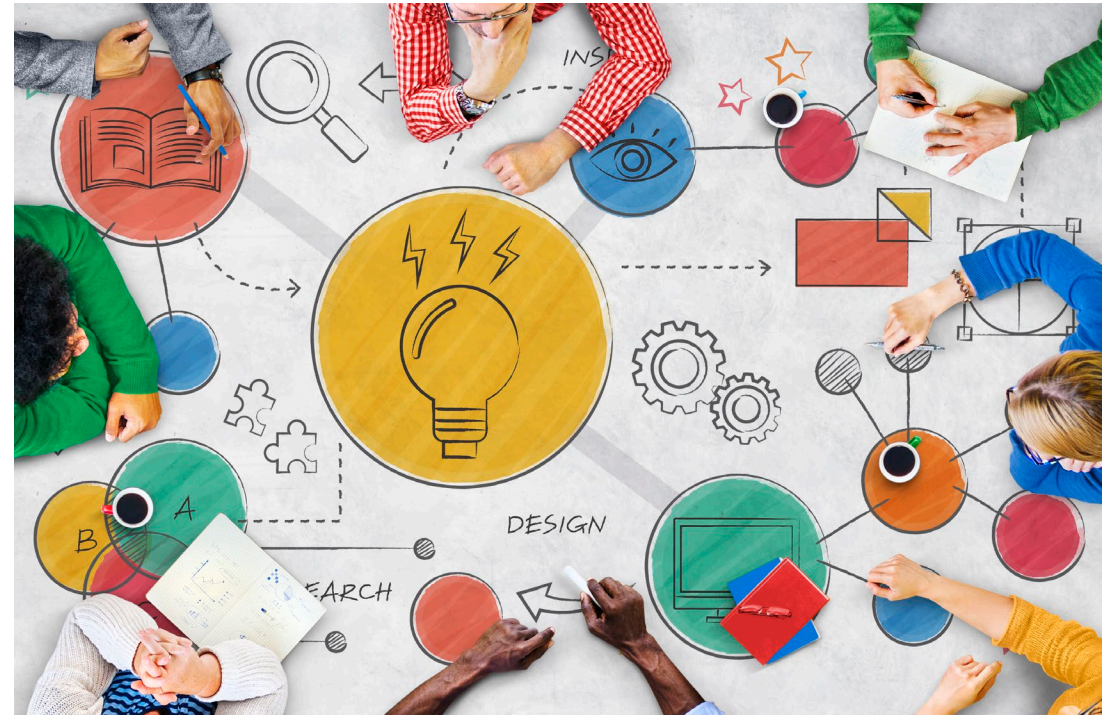
Mallory McClester Brown, MD

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Outline of today's session

1. Review purpose of Urinalysis (UA) and components of UA
2. Review the McGeer Criteria
3. Discuss prevention of UTIs
4. Discuss treatment for UTIs



A Common Case

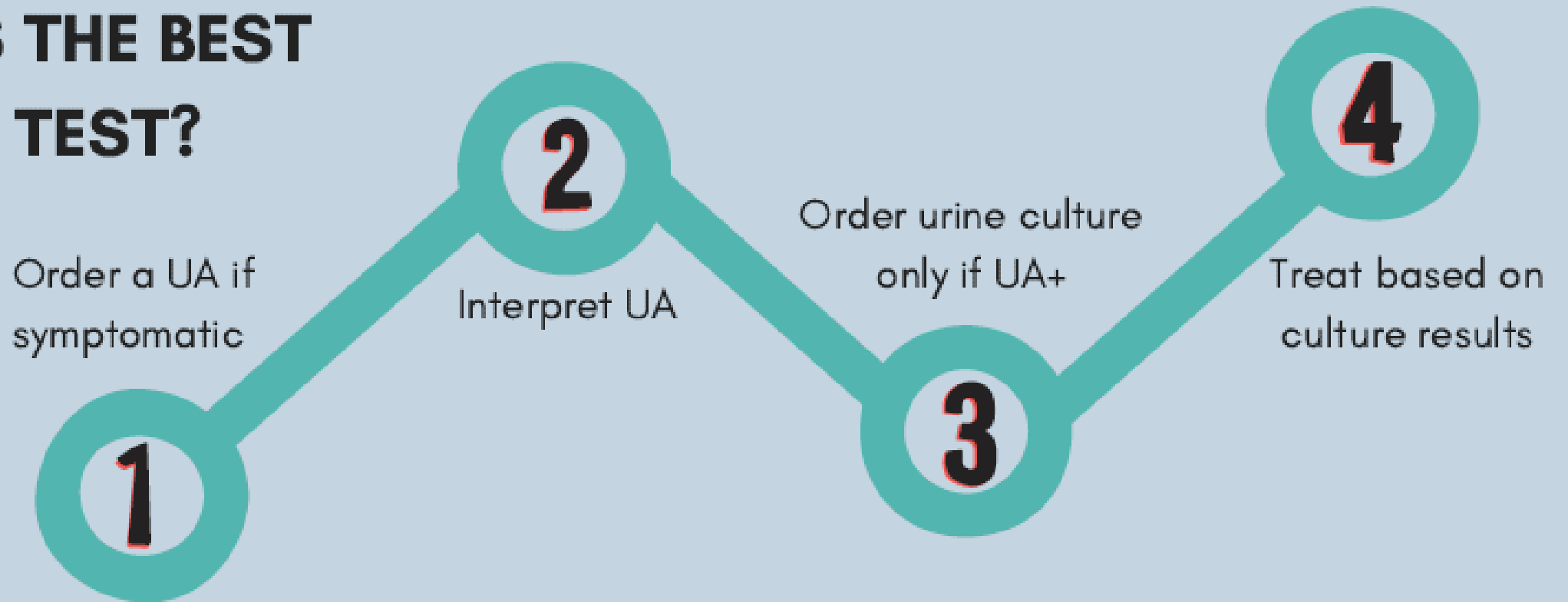
- ▶ 84 yo F living in your facility is “more fatigued” today per son’s report. Staff notes she has eaten less than usual and does seem more fatigued but has no other symptoms of note. Son insists that this is what happens “every time Mom has a uti” and requests that antibiotic treatment be initiated now. How do you respond?

Who needs a UA?

Poll: Which of these needs a UA?

- ▶ Foul-smelling urine
- ▶ Patient is unusually sleepy
- ▶ Worsening or new incontinence
- ▶ New burning with urination

WHAT IS THE BEST WAY TO TEST?



Who Needs a UA?

- ▶ Burning
- ▶ Frequency
- ▶ Irritation
- ▶ Urgency
- ▶ New Blood in the Urine

Dipstick Urinalysis

- ▶ Leukocyte esterase
- ▶ Nitrites
- ▶ Protein
- ▶ Blood



Dipstick Urinalysis

- ▶ Leukocyte esterase positive (pyuria)
- ▶ Nitrites: positive (bacteriuria)
- ▶ Protein: small amount may be present
- ▶ Blood: small amount may be present

Leukocyte positive: 50–75% specific; 80-90% sensitive

Pyuria alone not an indication for treatment.



Using the UA



At 8pm, a urine is drawn on a resident who has had poor po intake and some additional urinary frequency. This resident has cognitive impairment, therefore it is unclear if she has burning or pain with urination.



The UA shows no leukocyte esterase and negative nitrites.



How should this result be utilized?

UA: Hematuria

- ▶ Blood is not common with UTIs in older adults.
- ▶ Frank hematuria should be evaluated promptly!
- ▶ Causes:
 - ▶ Stones
 - ▶ Cancer
 - ▶ Trauma
 - ▶ **Infection**
 - ▶ Hemorrhage



McGeer Criteria

- ▶ Must fulfill both 1 AND 2
 - ▶ 1. At least 1 of the following signs/symptoms
 - ▶ 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 or 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 1 of the following microbiological criteria:
 - ▶ $\geq 10^5$ cfu/mL of no more than 2 species of organisms in a voided urine sample
 - ▶ $\geq 10^2$ cfu/mL of any organism(s) in a specimen collected by an in-and-out catheter

Society for Healthcare Epidemiology Long-Term Care Special Interest Group. Surveillance definitions of infections in long-term care facilities: revisiting McGeer Criteria; doi: 10.1086/667743

UTIs

- ▶ Primary cause of bacteremia in LTC residents is due to UTIs!
- ▶ Incidence of **symptomatic UTIs** in elderly in LTC around 10%
- ▶ **Asymptomatic bacteriuria** prevalence:
 - ▶ 30% Females/ 10% Males

CDC NHSN UTI Definitions

- ▶ Urinary Tract Infection (UTI)/Cystitis
 - ▶ infection of the bladder (lower urinary tract).
- ▶ Pyelonephritis –
 - ▶ infection of the upper urinary tract (ureters / renal collecting system / kidneys).
- ▶ “Mixed flora” is not considered an organism and cannot be reported.
- ▶ Yeast **cannot** be reported as an organism for a UTI.

UTIs: WHY?

Physiologic changes of bladder with aging:

Women:

Elevation of vaginal pH due to estrogen deficiency

Results in increased ability of bacteria to adhere to the mucosal cells of the bladder.

Bladder may be chronically colonized, no longer a sterile organ.

Men:

Decreased bactericidal activity of prostatic secretions

Increased post-void residual volume of urine due to prostate size

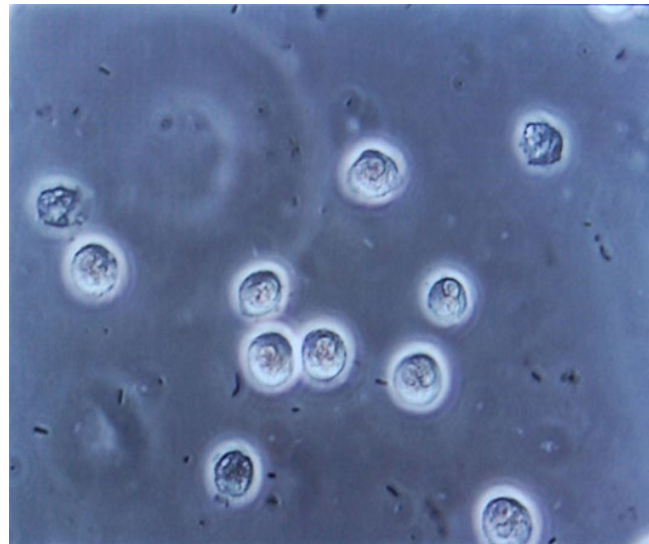
Prostate hypertrophy

Both:

Neurogenic bladder from comorbidity

Microbiology of UTI

- ▶ 80% are caused by **gram negative bacilli**
 - E.coli, Klebsiella, Enterobacter, Proteus, and Serratia
 - Gram positive bacilli - Staphylococcus



Urine Culture

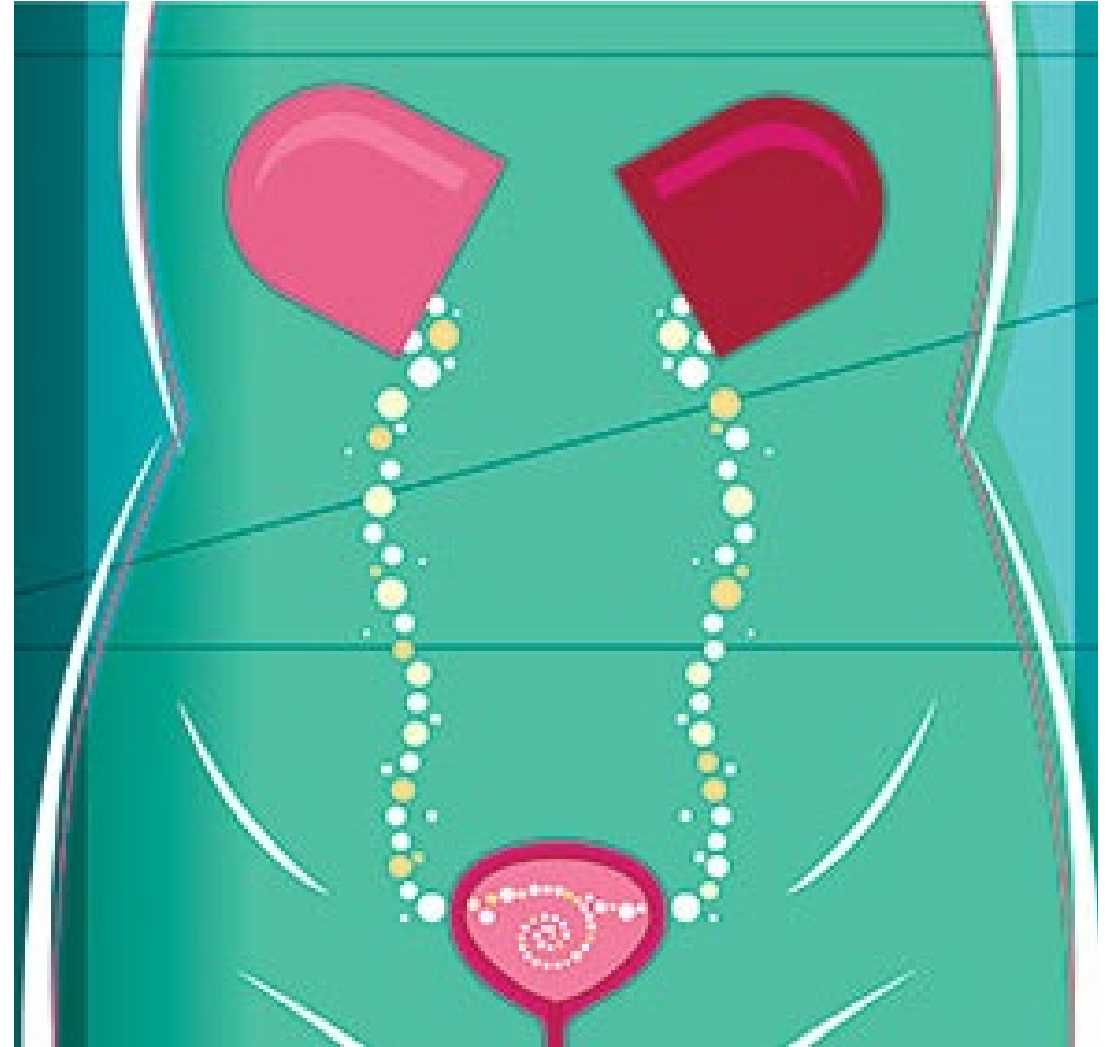


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- ▶ Gold STANDARD to guide appropriate treatment
- ▶ Results : **>100,000 colonies** of one species
- ▶ Treatment can be delayed until culture results available
- ▶ Positive culture (bacteriuria) alone **not** a reason to treat

Treatment /NO Treatment

- Asymptomatic bacteriuria should **NOT** be treated
- Routine or post-treatment screening for bacteriuria is not recommended. (Infectious Diseases Society of America)
- No benefits in decreasing rates of subsequent UTIs
- Increased risk of resistance and uropathogens



CMS UTI Antibiotic Treatment

Minimum criteria for initiating antibiotics for UTI

NO indwelling catheter, include:

1. acute dysuria alone or fever ($>37.9^{\circ}\text{C}$ [100°F] or 1.5°C [2.4°F] increase above baseline temperature) and at least one of the following:
 - new or worsening urgency, frequency, suprapubic pain, gross hematuria, costovertebral angle tenderness, or urinary incontinence.



Reference - "Development of Minimum Criteria for the Initiation of Antibiotics in Residents of Long-Term-Care Facilities: Results of a Consensus Conference" - Infect Control Hosp Epidemiol 2001;22:120-124.

Prevention of UTIs

- ▶ Hand Hygiene – both residents and staff
- ▶ Adequate hydration – 30cc/kg of body weight/day
- ▶ Perineal hygiene after toileting
- ▶ Routine toileting
- ▶ *Removing urinary catheter as early as possible*

Prophylaxis For UTI Prevention

- ▶ **Cranberry juice/extract** – Cochrane guidelines from 2022 with some evidence to support use



- ▶ **Oral Estrogens** not shown to be beneficial.
- ▶ Topical, **vaginally applied estrogens** have been shown to be effective – 6 studies applying estrogen by ring, cream, or intravaginal tablet

Antoniou & Somani. Eur Urol Focus. 2022 Nov;8(6):1768-1774

Perrotta et al. Cochrane Database of Systematic Reviews 2008, Issue 2. Art. No.: CD005131

Prophylaxis for UTI prevention

- ▶ Methenamine vs Antibiotics in NH Patients (ALTAR Trial)
- ▶ 102 with daily antibiotics vs 103 with methenamine Hippurate over 12 months
 - ▶ Abx Rx: 0.89 episodes/person/year (95% CI, 0.65-1.12);
Methenamine RX: 1.38 episodes/person/year (95% CI, 1.05-1.72)
 - ▶ Development of resistance among E Coli: 72% of participants in daily antibiotics group vs 56% in the methenamine arm (p = 0.05)
 - ▶ 52% of cultures during “symptomatic UTIs” grew bacteria

Saul H, et al. C. Methenamine is as effective as antibiotics at preventing urinary tract infections. BMJ. 2023 Jan 17;380:72.

Harding C, et al. Alternative to prophylactic antibiotics for the treatment of recurrent urinary tract infections in women: multicentre, open label, randomised, non-inferiority trial. BMJ 2022;376:e068229.

De-escalation in Urinary Tract Infection

1. Shorter length of therapy
 - Standard of care depends on the antibiotic choice, but is now typically 3 or 5 days
 - Minimum necessary is best
2. Narrowing of spectrum
 - Utilize the culture results
 - Consider awaiting treatment until these culture results return to ensure the appropriate antibiotic is being utilize.
3. Is this truly a UTI?

A Common Case

- ▶ 84 yo F living in your facility is “more fatigued” today per son’s report. Staff notes she has eaten less than usual and does seem more fatigued but has no other symptoms of note. Son insists that this is what happens “every time Mom has a uti” and requests that antibiotic treatment be initiated now. How do you respond?

WHAT IS THE BEST WAY TO TEST?

Order a UA if symptomatic

1

Interpret UA

2

Order urine culture only if UA+

3

Treat based on culture results

4

Resources, Questions, and Discussion

DO I REALLY NEED TO TREAT MY PATIENT FOR A UTI?

TREATING ASYMPTOMATIC BACTERIURIA HAS NO BENEFITS AND CAUSES HARM.



Costs for Patients



Lengthened Hospital Stays



C. difficile infections



Antibiotic resistance

MY PATIENT IS SICK AND I SUSPECT A UTI. SHOULD I SEND A UA?

A May Be Helpful

When Patient Has

- ✓ Urination frequency
- ✓ Burning or pain during urination
- ✓ Urgency
- ✓ New blood in urine

No UA Needed

- ✗ Foul-smelling urine
- ✗ Urine color or cloudiness
- ✗ Altered mental status **alone** (sleepiness, confusion)
- ✗ Fever or leukocytosis **without urinary symptoms**

DECISION POINTS

Order a UA if symptomatic

1

Interpret UA

2

Order urine culture if UA+

3

Treat or adjust treatment based on culture results

4



For more information, review the 15-minute refresher on using UA and urine cultures in older adults.



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