

Breaking the Cycle: A Practical Approach to Recurrent UTI

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CHI Health / Commonspirit

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Disclosures

- I received support from Merck & Co, Inc. for investigator-initiated study unrelated to this presentation.
- I did not use AI to prepare this presentation but utilize Powerpoint's design suggestions.
- Cases in the presentation are based on actual clinical scenarios

Objectives

Distinguish

- Recurrent UTIs vs. asymptomatic bacteriuria

Identify

- Targeted diagnostic approach to recurrent UTIs

Utilize

- Evidence-based management strategies

Avoid

- Low-value antibiotic prophylaxis

Definitions

Recurrent UTI

- More than 2 UTIs in 6 months
- More than 3 UTIs in a year

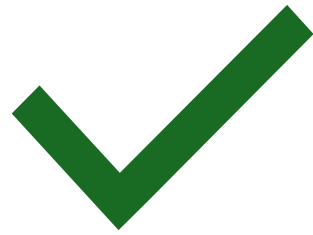
Relapsed UTI

- Re-emergence of UTI due to the same bacterial species within 2 weeks of completion of treatment

Asymptomatic bacteriuria (ASB)

- Presence of bacteria in the urine in the absence of urinary symptoms
- Most common in older women, patients with diabetes mellitus, chronic catheter, h/o GU abnormalities

Does the patient truly have infection symptoms?



Symptoms that support acute cystitis

Dysuria
Frequency
Urgency
Suprapubic pain
New hematuria



Findings that do not establish UTI

Cloudy urine
Foul odor
Pyuria alone
Positive dipstick
Positive culture without symptoms
Altered mental status or behavioral change
Falls

Case 1



A 54 yo F has a history of hypertension, hyperlipidemia and well controlled type 1 diabetes mellitus.

Presents with recurrent UTI and recent urine cultures with ESBL E. coli.

Symptoms: cloudy urine, occasional smell.

Negative symptoms: fever, dysuria, hematuria, urinary frequency, incontinence.

Chronic constipation for which she is on linaclotide and prucalopride.

Prophylaxis: Uses postcoital nitrofurantoin x1

Urine cultures monthly x6 months, always E coli, most recent is ESBL positive

Treated with a variety of antibiotics over time including TMP-SMX, cephalexin, and fluoroquinolones.

Case 1 – Diagnosis?

- A. Relapsed UTI
- B. Recurrent UTI
- C. Uncomplicated UTI
- D. Asymptomatic bacteriuria



Case 1 – Diagnosis?

- A. Relapsed UTI
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Cloudy or malodorous urine are not considered symptoms of UTI.

Getting the Diagnosis Right



Underlying diagnoses

ASB

Genitourinary syndrome of
menopause

Overactive vs neurogenic bladder

Interstitial pain

Ureteral obstruction, stones

Etc.



Risk Factors for rUTI

Sexual activity

Spermicides

Post-menopausal estrogen
deficiency

Prior antibiotic exposure

Urinary retention



Overdiagnosis drives

Unnecessary antibiotics

Antimicrobial resistance

Adverse drug events

Persistent cycling of urine cultures
and retreatment

Consider your differential

[Dayson et al. Can Urol Assoc J. 2011 Oct; 5\(5\): 316–322.](#)

If your patient has this...	Rule out this
Prior urinary tract surgery or trauma	Surgical / anatomic complication
Hematuria (gross or microscopic) after UTI resolution	Stones, GU cancer
Previous bladder or renal calculi	Recurrent stones
Straining, weak stream, intermittency, hesitancy	Obstruction (consider BPH, prostate pathology)
High post-void residual	Obstruction, neurogenic bladder, incomplete bladder emptying

Consider your differential

[Dayson et al. Can Urol Assoc J. 2011 Oct; 5\(5\): 316–322.](#)

If your patient has this...	Rule out this
Urea-splitting bacteria (Proteus, Yersinia)	Stones (staghorn calculi)
Relapsed UTI (same organism within 2 weeks of completing therapy)	Calculi, abscess, retained foreign body (i.e. ureteral stent)
Prior abdominopelvic malignancy	Tumor compression, post-surgical stricture
Concurrent diabetes mellitus	Poor blood glucose control
Pneumaturia, fecaluria, anaerobic bacteria	GI-GU fistula
Recurrent pyelonephritis	Abscess, infected renal cyst

Case

- Mr. Johnson is an 82 y/o man who enjoys spending time with his newest grandchild
- Due to a spinal cord injury, he has performed self-catheterization 3 times daily for many years and has done well.
- He suddenly starts having recurrent UTIs presenting with fevers
- Culture shows *E. coli* sensitive to nitrofurantoin



Poll Question

- Which of the following options is **NOT** part of initial management?
 - A. Observe catheterization w/post-void residual
 - B. Order an ultrasound
 - C. Refer to Urology for further evaluation
 - D. Order nitrofurantoin x 6 months for UTI prophylaxis



Poll Question

- Which of the following options is **NOT** part of initial management?
 - A. Observe catheterization w/post-void residual
 - B. Order an ultrasound
 - C. Refer to Urology for further evaluation
 - D. **Order nitrofurantoin x 6 months for UTI prophylaxis**

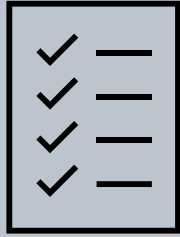


Case Wrap Up

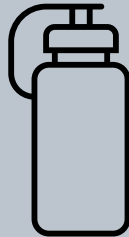
- Mr. Johnson had high post-void residuals after observed catheterizations.
- Bladder ultrasound revealed moderate sediment and a bladder diverticulum.
- Gentamicin bladder irrigation was performed in the urology office and cleared the sediment.
- Recommendation:
Scheduled catheterizations every 4-6 hours moving forward to prevent urinary retention and bladder overdistension. Consider suprapubic catheter in the future.
- Please note: In a patient with a chronic catheter, the bag should always be below the level of the bladder, and catheters should be exchanged every month.



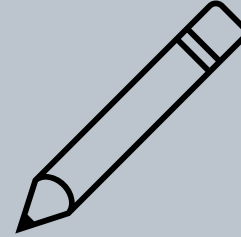
Non-Pharmacologic Management



Address
underlying
conditions &
review
medications



Increase fluid
intake:
↑ by 1.5
L/day = 50%
↓ in rUTI over
12 months

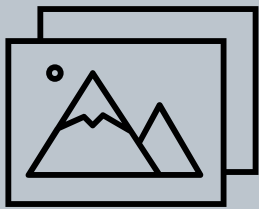


Assess post-
void
residuals &
schedule
voids or
caths



Post-coital
voiding
(low risk,
limited data)

Non-Pharmacologic Management, cont.



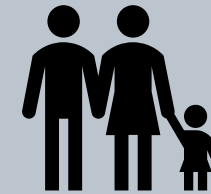
Advanced
imaging
and/or
referrals



Manage
constipation



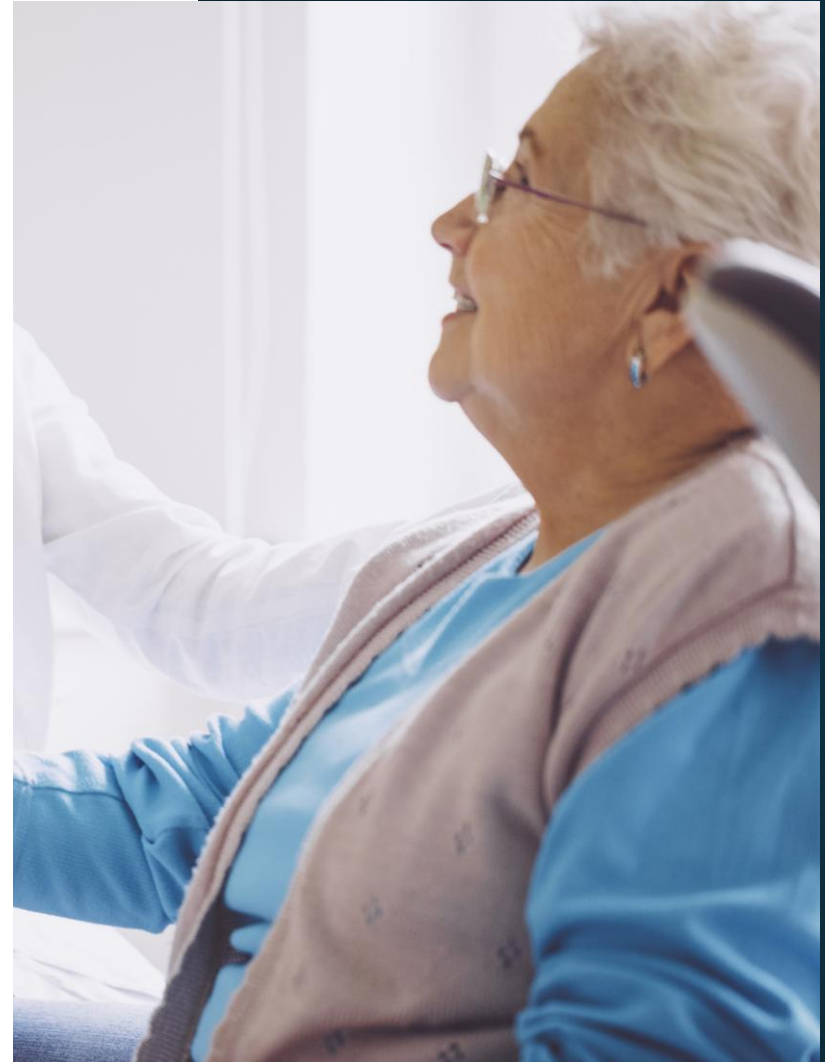
Foley care
and
maintenance,
especially if
stool-
incontinent



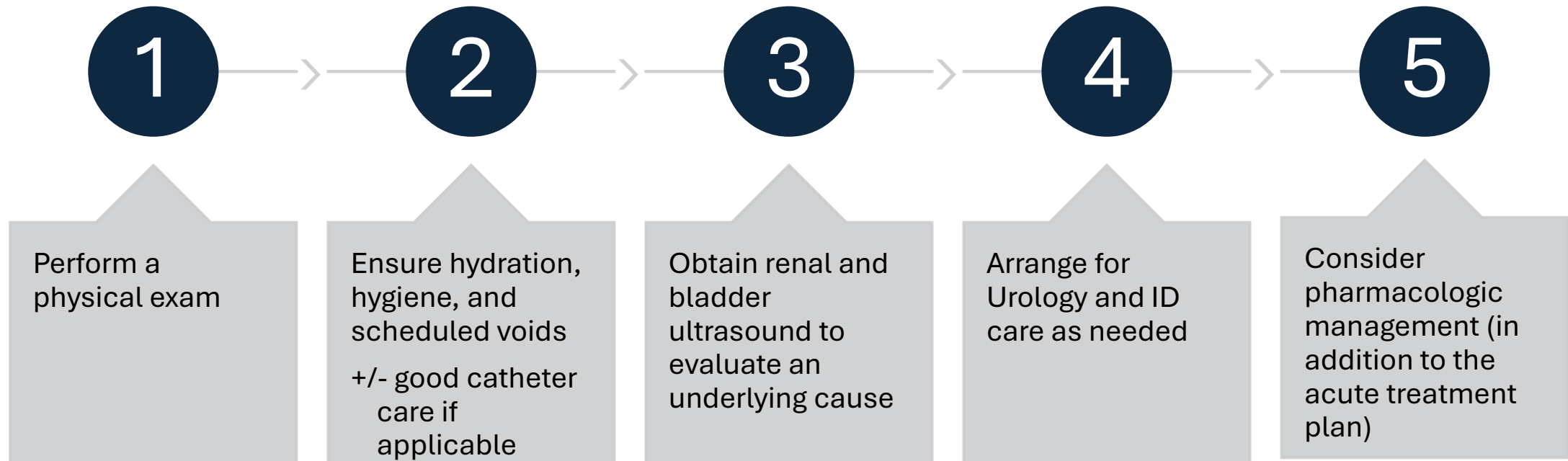
Education of
patient,
family and
staff

Case

- Mrs. Diaz is a 74 y/o retired school teacher with 3 UTI infections in 9 months
 - She is reporting pain with urination, typically end of stream + bladder spasm. Feels different than UTIs in her 20-30s
 - During her previous episodes, urine cultures have revealed *K. pneumoniae* and ESBL *E. coli* > 100k CFUs
 - Antibiotics seem to help symptoms initially, but pain return shortly after completing therapy.
 - What else should you consider in your plan of care?

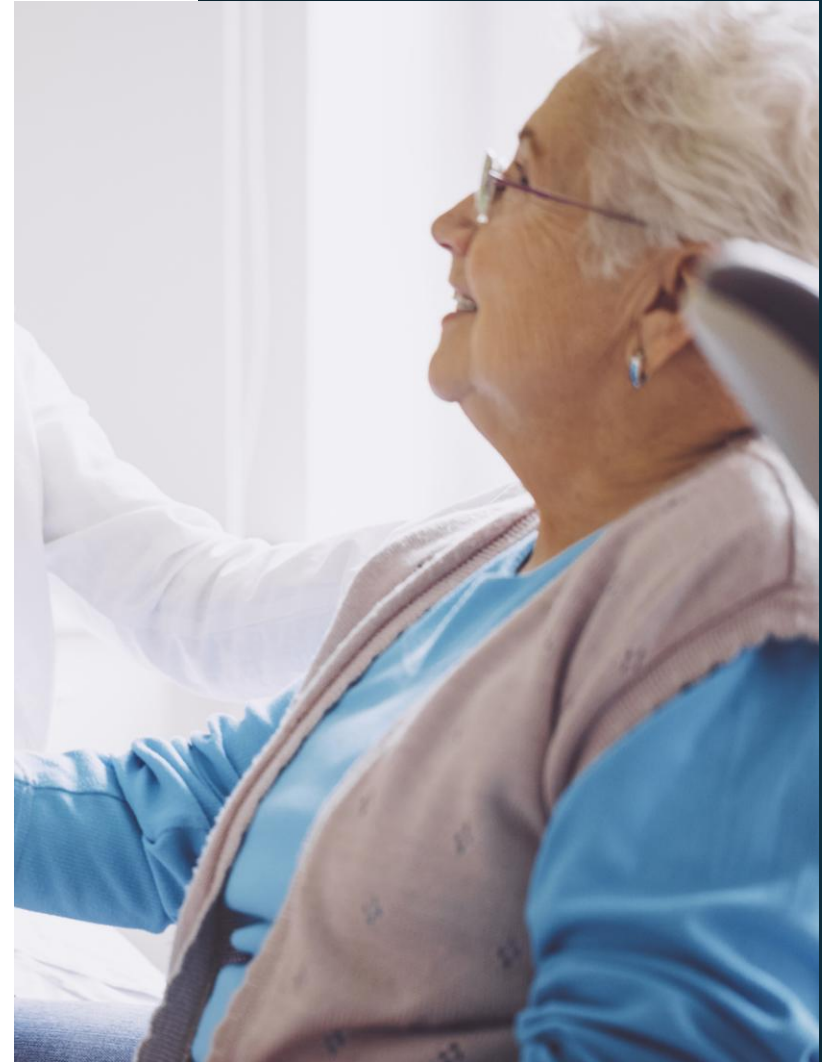


Clinical Next Steps



Case Cont'd

- Mrs. Diaz saw urology – cystoscopy did not reveal any pathology.
- Prescribed vaginal estrogen but she is nervous to start because her mother died of metastatic breast cancer. (She has no personal history of cancer).
- Tries to drink, but not that thirsty.
- She has difficulty with constipation



Medication Management Recurrent UTIs



NON-ANTIBIOTIC
OPTIONS



ANTIBIOTIC
PROPHYLAXIS

Vaginal Estrogen

- Preventing rUTI is considered off-label use
- *In peri- and post-menopausal women with rUTIs, clinicians should recommend vaginal estrogen therapy if no contraindication to estrogen therapy. (AUA moderate rec, grade B evidence)*
- Meta-analysis of 5 studies: women treated with estrogen had significantly fewer UTI recurrences vs placebo (RR 0.58, 95% CI 0.39-0.87)
- Vaginal estrogen $\neq$ systemic therapy
 - ACOG: Low-dose vaginal estrogen may be used after risks vs benefits in individuals with h/o breast cancer, including while on tamoxifen; shared decision (pt, onc, gyn) making if on aromatase-inhibitor



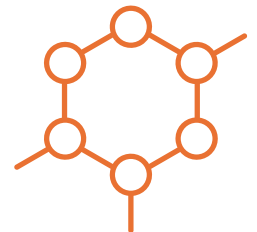
Cranberry Products

- Dietary supplement (not FDA-approved) - proanthocyanidins (PACs) prevent bacterial adhesion to the uroepithelial cells
- Capsules, cocktails, juices; varying concentrations
- A 2023 Cochrane review of 50 studies (8,857 participants) found that cranberry products reduced the risk of symptomatic, culture-verified UTIs (RR 0.70, 95% CI 0.58-0.84)
- AUA: *Clinicians should offer cranberry as an option for prophylaxis for women with rUTIs* (moderate recommendation, grade B evidence)
 - Cranberry supplements standardized to at least 36 mg PACs



Methenamine Hippurate

- Non-antibiotic alternative to prophylactic antibiotics in women with rUTIs
- Works by acidifying the urine, which prevents bacterial invasion of the urinary tract
- FDA-approved for UTI prophylaxis
- RCT, non-inferiority study: methenamine hippurate vs antibiotic prophylaxis (nitrofurantoin, trimethoprim, cephalexin) both for 12 months
 - Both similarly reduced UTIs; methenamine deemed non-inferior
 - Low rate of adverse events
- *AUA: Clinicians may offer methenamine hippurate for prophylaxis for women with rUTIs. (Conditional recommendation; grade C evidence)*
- Contraindicated with CrCl <30



D-Mannose

- Dietary supplement (not FDA-approved) - simple sugar that prevents bacterial adhesion to the uroepithelial cells
- Cochrane review of 7 RCTs – not high quality, limited sample sizes, no standardized dosing regimens, variable outcome measures → no rec.
- Largest RCT in 2024 showed d-mannose did not reduce UTI incidence compared to placebo in women with rUTIs.
- AUA: *Clinicians should inform patients with rUTIs that d-mannose alone for prophylaxis may not be effective in UTI prevention* (moderate recommendation, grade B evidence)

[Cooper, T et al. Cochrane Database Syst Rev. 2022 Aug 20;8\(8\):CD013608](#)
[Mort S et al. JAMA Intern Med 2024;184\(6\):619-28.](#)
[Anger J et al. Recurrent Uncomplicated UTI in women: AUA Guideline 2025](#)



Antibiotic Prophylaxis

Fihn SD et al. NEJM 2003.
Hooten TM et al. NEJM 2012
Fisher H et al. Lancet ID 2018
AUA/CUA/SUFU Guideline on Recurrent Uncomplicated
UTI in Women 2025

Effective during active use

- Reduces rUTI frequency by 50-95%
- Decreased recurrences from 2-3 episodes/patient-year to 0.1-0.2
- In adults performing clean intermittent self-catheterization (AnTIC), reduced UTI frequency by 48%

Options

- Continuous daily prophylaxis
- Single-dose postcoital if intercourse-associated

TMP 100 mg QD

TMP-SMX 40 mg/200 mg QD or 3x/wk

Nitrofurantoin 50-100 mg QD

Cephalexin 125-250 mg QD

Fosfomycin 3 g every 10 days

AUA: Antibiotic prophylaxis may be offered after discussion of risks, benefits, and alternatives (conditional rec, grade B evidence)

Antibiotic Prophylaxis Tradeoffs



Antimicrobial resistance

In AnTIC, resistant isolates were more common after 9-12 mo:

- Nitrofurantoin resistance: 24% vs 9%
- Trimethoprim resistance: 67% vs 33%
- TMP-SMX resistance: 53% vs 24%

Fisher H et al. Lancet ID 2018

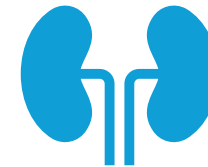


Adverse effects

Occur in 7-40% of patients, depending on the antibiotic

Common: GI upset, rash, candidiasis
Nitrofurantoin intolerance in some (N/V/stomach pain)

Fihn SD et al. NEJM 2003.
Fisher H et al. Lancet ID 2018
Veauthier B et al. AFP 2020



Possible harm in older adults

Adults >65y, prophylaxis associated with more ED visits/hospitalizations for UTI, sepsis, bloodstream infection: 4.7% vs 3.6%; HR 1.33 (95% CI 1.12-1.57)

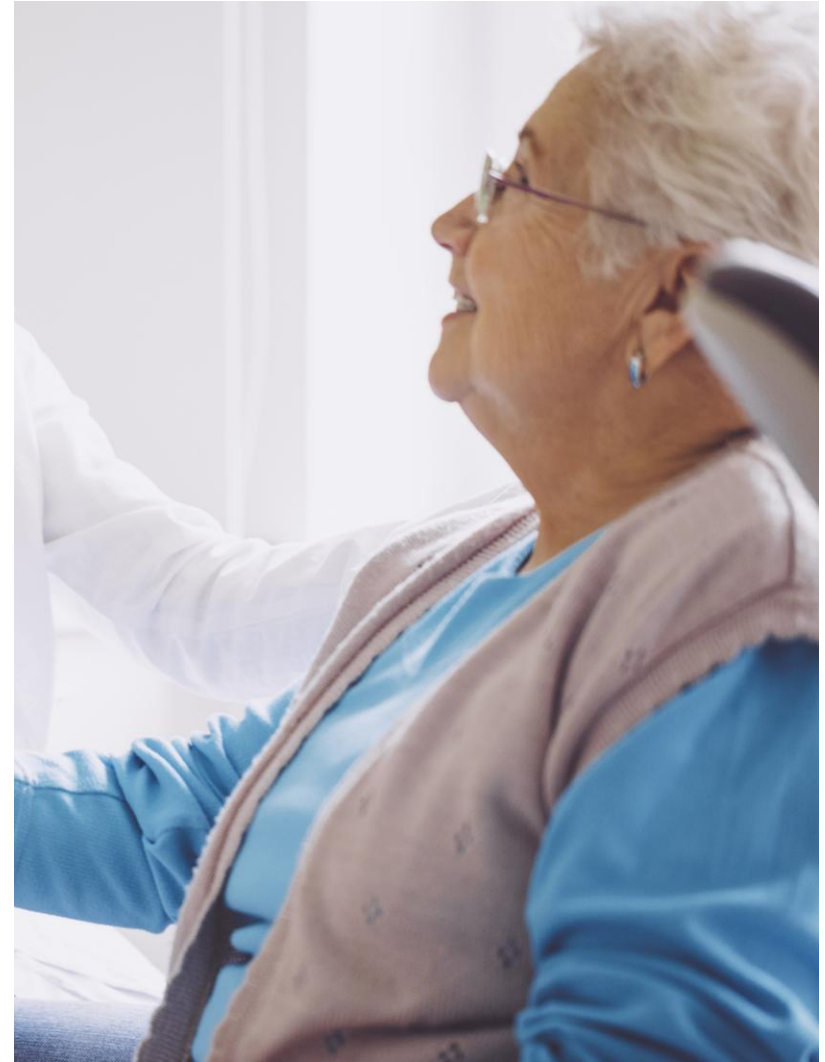
C diff infection: HR 1.66

Medication AE: HR 1.62

Langford BJ et al. CID 2021

Case Resolution

- Mrs. Diaz utilized vaginal estrogen with marked improvement in her symptoms of urethral irritation.
- Working to drink more fluids and increase fiber intake.
- Educated about avoiding urine tests if no symptoms.
- Plan is for episodic treatment of UTI(s) if she does have GU symptoms suggestive of UTI.



Key Take-Home Points

Recurrent UTI requires recurrent symptoms, not just positive cultures

Assess the veracity of previous UTI diagnoses!

Work up any underlying etiologies

Highest-yield prevention strategies:

- Vaginal estrogen in peri- / post-menopausal women
- Increase water intake if low baseline
- Consider cranberry & methenamine
- Reserve antibiotic prophylaxis for select patients after alternatives attempted. (Opt for episodic treatment of UTIs instead.)

Questions?

