# Management of Suspected Urinary Tract infections in Post-Acute and Long-Term Care Facilities

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# Objectives

- Describe the signs and symptoms associated with urinary tract infections
- Understand the step wise approach to manage a resident with suspected urinary tract infections

# Important Definitions

**Pyuria**

- >10 white blood cells (WBC)/mm3 per high-power field noticed on UA
- Can be present without an infection

**Bacteriuria**

- Presence of bacteria in the urine
- Can be present without an infection

# Important Definitions

**Asymptomatic Bacteriuria**

- Bacteriuria without any signs and symptoms of UTI
- Usually no antibiotic is required even if pyuria (or abnormal UA) is present

**Symptomatic UTI**

- Bacteriuria with infection related genitourinary signs and symptoms
- Will require antibiotic treatment

# Diagnosis of UTI in Patients Without Indwelling Catheter

| Noncatheterized |
| --- |
| Minimum criteria include 1 of the following:<br>• Acute dysuria or acute pain, swelling or tenderness of testes, epididymis or prostate<br>OR<br>• Fever (≥38°C or increase of at least 1.1°C above baseline), rigors or leukocytosis and at least 1 of the following symptoms (see below)<br>OR<br>• At least 2 of the following *symptoms*:<br>  • New or increased frequency<br>  • New or increased urgency<br>  • New or increased incontinence<br>  • Suprapubic pain<br>  • Acute flank pain or tenderness<br>  • Gross hematuria |

Beahm NP et al. Can Pharm J (Ott). 2017 Jul 31;150(5):298-305

# Diagnosis of UTI in Patients With Indwelling Catheter

| Catheterized |
| --- |
| Minimum criteria include *no alternative diagnosis* AND 1 of the following:<br>• Fever (≥38°C or 1.1°C above baseline), rigors or new-onset hypotension<br>• Leukocytosis and either an *acute change* in mental status or acute functional decline<br>• New-onset flank or suprapubic pain or tenderness<br>• Purulent discharge from catheter site<br>• Acute pain, swelling or tenderness of testes, epididymis or prostate |

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# Difference between Uncomplicated and Complicated UTI

**Uncomplicated UTI**

- UTI in a patient with no structural or functional urinary tract abnormality
- Usually need treatment for shorter duration

**Complicated UTI**

- UTI in a patient with structural or functional urinary tract abnormality
- Duration slightly longer than for uncomplicated UTI

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## Table 2. Factors Associated with Complicated UTI[4]

| Factors | Examples | |
|---|---|---|
| Obstruction | Ureteric or urethral strictures<br>Nephrolithiasis<br>Diverticula<br>Renal cysts | Tumors of the urinary tract<br>Prostatic hypertrophy<br>Pelvicalyceal obstruction<br>Congenital abnormalities |
| Instrumentation | Indwelling urethral catheter<br>Ureteric stent<br>Urologic procedures | Intermittent catheterization<br>Nephrostomy tube |
| Impaired voiding | Neurogenic bladder<br>Vesicoureteral reflux | Cystocele<br>Ileal conduit |
| Metabolic abnormalities | Nephrocalcinosis<br>Renal failure (eCrCl <30 mL/min)[17] | Medullary sponge kidney |
| Others | Immunosuppressed (renal transplant)<br>Pregnancy | Male sex |

Abbreviations: eCrCl = estimated creatinine clearance

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# Pyelonephritis

- Infection of the kidney (renal parenchyma and renal pelvis)
- Patient usually more sicker as compared to when they have lower urinary tract infections
- Signs and Symptoms may include:
    - Fever, rigors and/or chills
    - Flank pain / Costovertebral angle tenderness
    - Nausea and/or vomiting
- Usually need slightly longer duration of antibiotic treatment (7 to 14 days depending on the antibiotic being used)

# When is a UA helpful ?

- When UA results are not suggestive of infection then it is very helpful to rule out a urinary tract infection even when urine cultures are positive.

- UA is not suggestive for infection when we see the following:

    - Negative Nitrite
    - Negative leukocyte esterase (LE)
    - <10 white blood cells (WBC)/mm3 per high-power field

- A positive UA by itself does not help in making a diagnosis

# Significant Growth on Urine Culture

- Without indwelling catheter
  - $\geq 10^5$ 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
- With Indwelling catheter
  - Urinary catheter specimen culture with $\geq 10^5$ cfu/mL of any organism(s)

- 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

# Understanding and Using the SBAR tool for Communication: The need for Background Information

**Clinical Assessment and Communication Tool Template for Suspected UTI**

| [Facility Logo] | Resident Label |
|---|---|

| | |
|---|---|
| **S** | **Situation**<br>I am concerned about a suspected UTI for the above resident. |
| **B** | **Background**<br>Indwelling catheter ☐Yes ☐No If yes, ☐ Urethral ☐ Suprapubic<br>Incontinence ☐Yes ☐No If yes, is this new or worsening ☐Yes ☐No<br>UTI in last 6 months ☐Yes ☐No If yes, Date: _____ Organism: _____ Treatment: _____<br>Active diagnosis (especially bladder, kidney, genitourinary conditions; diabetes; receiving dialysis, anticoagulants):<br>_____<br>Advance directives for limiting treatment (especially antibiotic use): _____<br>Medication allergies: _____ |

# Understanding and Using the SBAR tool for Communication: The need for Proper Assessment

**A**

**Assessment**

Vital signs: BP____ /____ HR_____ Resp. rate_____ Temp._____ $O_2$ Sats._____

| **Resident WITH indwelling catheter** | **Resident WITHOUT indwelling catheter** |
|---|---|
| The criteria are met to initiate antibiotics if one of the following are selected:<br><br>No Yes<br>☐ ☐ Fever of 100°F (38°C) or repeated temperatures of 99°F (37°C)<br>☐ ☐ New back or flank pain<br>☐ ☐ Rigors / shaking / chills<br>☐ ☐ New onset delirium (new dramatic change in mental status)<br>☐ ☐ Hypotension (significant change in baseline BP or SBP <90)<br>☐ ☐ Acute suprapubic pain<br>☐ ☐ Acute pain, swelling or tenderness of the scrotal area | Criteria are met to initiate antibiotics if one of the three situations are met:<br><br>No Yes<br>☐ ☐ Any one of the following two:<br>☐ Acute dysuria alone (pain or burning while urinating)<br>☐ Acute pain, swelling or tenderness of the scrotal area<br>*OR*<br>☐ ☐ Single temp of 100°F (38°C) and at least one new or worsening of the following:<br>☐ Urgency ☐ Suprapubic pain ☐ Frequency<br>☐ Gross hematuria ☐ Back or flank pain ☐ Urinary incontinence<br>*OR*<br>☐ ☐ No fever, but two or more of the following symptoms:<br>☐ Urgency ☐ Suprapubic pain ☐ Frequency<br>☐ Gross hematuria ☐ Urinary incontinence |

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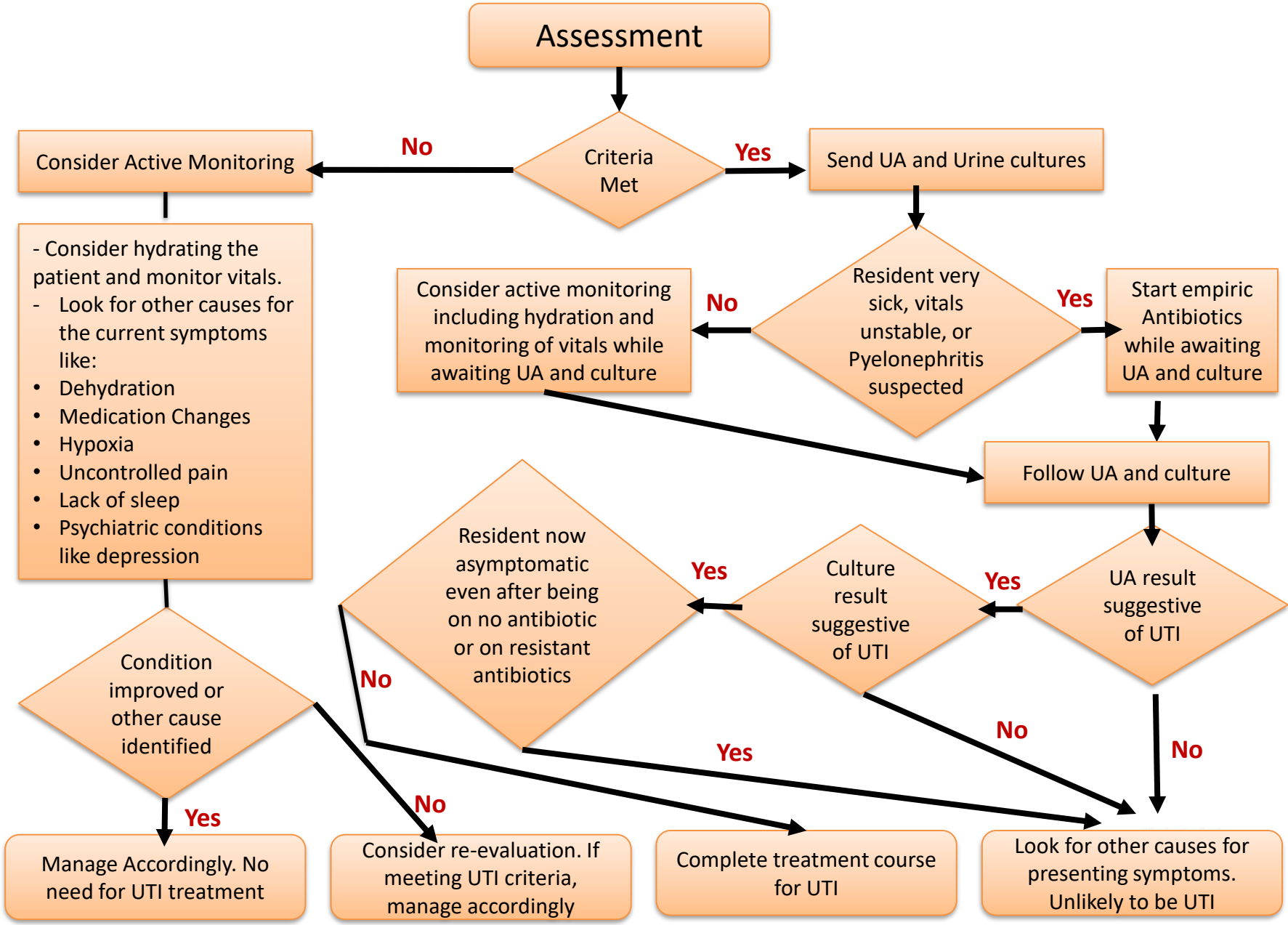
**R**

**Recommendation**

☐ **Protocol criteria met**. Resident may require UA and urine culture or an antibiotic.

☐ **Protocol criteria are NOT met**. Resident **DOES NOT** need immediate antibiotic but may need additional observation.

# Management Algorithm for Suspected UTI in LTCF



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## Table 1. Recommended Duration of Therapy

| Infection Syndrome | Typical Duration of Therapy |
|---|---|
| Uncomplicated cystitis[1,2] | 5 days for Nitrofurantoin<br>3 days for TMP/SMX<br>1 dose for Fosfomycin<br>3 days for Fluoroquinolones<br>3-7 days for Beta-Lactams |
| Pyelonephritis[1] | 7 days for Fluoroquinolones<br>14 days for TMP/SMX<br>10-14 days for Beta-Lactams |
| Catheter-associated urinary tract infection[3] or complicated* UTI[2,4] | 7 days if prompt resolution of symptoms<br>10-14 days if delayed response to therapy |

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# Can we identify problems in the following example?

**69 y.o. female resident of a nursing home went to see her PCP in the clinic with complaint of nightly cough and increased urinary frequency. She denies any dysuria, flank pain, nausea, vomiting, or fever.**

**PMH:** recurrent UTIs; on Nitrofurantoin 100 mg daily for suppression; obesity; and is on many medications

**Allergies:** Sulfa = hives/SOB, PCN = hives/SOB

**Physical Exam:** Unremarkable including stable vital signs

**UA results:** yellow, clear, nitrite negative, leukocytes negative, WBC 0-2, RBC neg, Epi cells 0-2, Bacteria 3+

**Assessment & Plan:** afebrile with no white cells; sent back to nursing home on current Nitrofurantoin

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**Culture result back 2 days later** Based on the culture growth started on Ciprofloxacin 500 mg PO BID x 10 days by PCP.

# Is the antibiotic use appropriate in the following scenario?

Elderly male patient s/p CVA who previously had an indwelling catheter was admitted to a nursing home after catheter removal about 2 years ago and was started on Flomax due to post void residuals of 150-400. He has also been on amoxicillin for UTI prophylaxis.

About 8 months later UA was ordered because of abnormal blood sugar level

Then around 1 year time 4 times UA and urine cultures sent with antibiotic courses almost every time consisting of nitrofurantoin or ciprofloxacin

# Would keeping prophylactic antibiotic in the following situation change anything?

After multiple episodes of UTI treatment resident ended up in the ER with abdominal pain and inability to speak complaint. Was diagnosed with UTI and treated and at this time Amoxicillin was stopped since has been on it over a year.

In the next 8 months was treated for additional 3-4 times for UTI.

Staff and family requested antibiotic prophylaxis for UTI but physician did not agree to that

Patient admitted to the hospital again with diagnosis of septic shock. Got treated came back without prophylactic antibiotics. Renal U/S showed kidney stones and horseshoe kidney. Patient now has an indwelling catheter

PCP started amoxicillin back again for prophlyaxis. A month later urologist stopped that and treated a UTI with ciprofloxacin but then a few days later called to start intramuscular ertapenem for 10 days

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