



Urinary Tract Infections in Continuing Care Centres

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Urinary Tract Infections (UTIs) are the most common infection in continuing care centres yet are one of the most difficult to diagnose. Assessment for UTIs can be particularly challenging if residents have non-specific symptoms or are unable to verbalize how they are feeling. Communication among nurses, physicians and pharmacists is crucial to ensure proper diagnosis and treatment for residents with suspected UTIs. Nurses play a key role in this dialog because they are the first to investigate the vast majority of UTIs in continuing care centres.

The Clinical Practice Guideline (CPG) for UTI in Continuing Care has recently been added to the library of CPGs published by the TOP (Towards Optimized Practice) program in Alberta. This CPG was developed with input from physicians, nurses and pharmacists working in continuing care centres. The CPG includes a Clinical Care Pathway designed to guide care and facilitate communication among the three professions. The clinical pathway is available from the continuing care desktop of Alberta Health Services and from the TOP website at: www.topalbertadoctors.org/informed_practice/clinical_practice_guidelines.html. It is a step-by-step guide to clinical decision making and is intended to remain as part of the resident chart. An introduction to the care pathway follows:

Step One. Does the resident have symptoms that indicate a UTI?

- **Typical symptoms in non-catheterized residents.** UTI should only be considered if the resident has typical, localizing symptoms. In non-catheterized residents this includes acute dysuria alone or an elevated temperature plus one of the following: new or increased urinary frequency, urgency or incontinence; new flank or suprapubic pain or tenderness; or hematuria.

Elevated temperature is a key indicator of UTI in the elderly, but it is important

that temperature be compared to baseline values.

- **Typical symptoms in catheterized residents.** Elevated temperature is a typical symptom of a UTI in catheterized residents. As for non-catheterized residents, a temperature $>38^{\circ}\text{C}$ or 1.1°C above baseline is significant. In addition, a UTI may be indicated by any of the following: new flank or suprapubic pain or tenderness; rigors; or new onset delirium.
- **Caution.** Non-specific symptoms including worsening of functional status, worsening of mental status, increased confusion, delirium or agitation, or increased falls indicate a change in resident's medical status but do not indicate a UTI unless typical symptoms are present. Unless medical status is declining rapidly, push fluids for 24 hours and then reassess. If typical symptoms develop, treat as for UTI. If non-specific symptoms continue without development of typical symptoms of a UTI, consider the possibility of an alternate diagnosis. If symptoms resolve, no further intervention is required.
- **Note.** With good hydration, non-specific symptoms often resolve. Importantly, if the resident is medically stable, there is no evidence of increased morbidity or mortality associated with waiting 24 hours to see if typical symptoms develop. Note that residents on fluid restrictions will need to be assessed and monitored individually.

Step Two. Discuss findings with physician or nurse practitioner

- **Resident status.** If the resident shows typical UTI symptoms, contact the physician or nurse practitioner. Be ready to report resident temperature, temperature in relation to baseline, changes in urinary function (dysuria,

new or increased frequency, urgency, or incontinence), presence of localizing pain or tenderness, and hematuria. For catheterized residents, new onset delirium is also an indication of UTI.

Because antibiotic therapy may be ordered, be prepared to discuss the resident's renal status. A recent calculated creatinine clearance (CrCl) is a measure of renal function and is helpful in making decisions about antibiotic selection and dosing.

- **Orders.** Orders may be obtained for a urine culture and sensitivity (C&S). Empiric antibiotic therapy may also be ordered depending on the resident's medical status.
- **Push fluids.** Continue to push fluids unless the resident is on fluid restriction.

Step Three. Collect urine specimen for C&S

Proper specimen collection and storage prior to transport to the laboratory will ensure optimal results.

- **Timing.** To make sure that laboratory results are meaningful, collect urine samples *before* initiation of antibiotic therapy.
- **Specimen collection.** For non-catheterized residents, midstream urine (MSU) samples should be collected to avoid specimen contamination. For female residents unable to provide a MSU sample, collection via an in/out catheter is recommended (an order from the physician or nurse practitioner is required for in/out catheterization). A freshly applied condom catheter can be used for males unable to provide a MSU sample. Urine should be collected in the C&S specimen container supplied by the laboratory.

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- **Specimen handling.** Make sure specimens are stored in the refrigerator while awaiting transport to the laboratory because organisms multiply quickly at room temperature. Specimens should be picked up and transported to the laboratory within 24 hours of collection.
- **Information for the laboratory.** Provide relevant resident history and clinical information for the laboratory such as symptom onset, catheterization, drug allergies, and the name of the antibiotic (if ordered before C&S results available) as this will assist laboratory staff with testing, interpreting and reporting C&S results.

Step Four. Urine C&S results

Review of a resident's urine C&S results is a critical step in ensuring appropriate treatment of UTI. Check each of the following points and discuss with the physician, nurse practitioner and/or pharmacist if needed.

- **Bacterial count.** A bacterial count $\geq 10^8$ cfu/L is significant and usually indicates a UTI in residents with typical symptoms. Bacterial counts $< 10^8$ cfu/L do not confirm a UTI. Note: A significant bacterial count alone does not indicate a UTI and antibiotic treatment is not indicated if the resident is asymptomatic or has non-specific symptoms.

If no infection is indicated by C&S testing, STOP antibiotics immediately.
- **Multiple organisms.** About 20% of UTIs are associated with more than one organism. The presence of three or more organisms usually indicates contamination; if so, a new specimen is needed.
- **Susceptibility.** The laboratory report will indicate which antibiotics will be effective against the organism(s) identified in the specimen. Check laboratory results against the medication orders to ensure that the organism causing the UTI is sensitive to the antibiotic which has been selected for therapy. In the case of multiple organisms, all organisms need to be sensitive to the prescribed antibiotic.
- **Retesting not needed.** Repeat C&S after antibiotic therapy is completed is NOT recommended unless symptoms of a UTI persist.

Step Five. Renal function and dose adjustment

- **Calculated creatinine clearance (CrCl).** Renal function decreases with age and is monitored in continuing care centres to facilitate medication management. A calculated CrCl < 60 ml/min indicates a significant loss of renal function and the need for adjustment of medication dosing. If an antibiotic has been prescribed, consult with the pharmacist to ensure that the dose is appropriate with respect to renal function.

COMMON MISCONCEPTIONS

Diagnosis of UTI using dipstick or Chem-9

Although a negative dipstick rules out a UTI, *a positive dipstick is not diagnostic for a UTI.* Pyuria, the presence of white blood cells in the urine, is very common in the elderly. In asymptomatic residents, pyuria is not related to a UTI and does not indicate antibiotics are needed. Routine dipsticks do not improve resident outcomes and are not recommended. Best practice includes resident monitoring and assessment followed by laboratory C&S testing if typical symptoms of a UTI are present.

Initiating antibiotics in the absence of UTI symptoms

Asymptomatic bacteriuria is the presence of bacteria in the urine of an individual who does not have symptoms of a UTI. The prevalence of asymptomatic bacteriuria increases with age and is very common among residents in continuing care centres. Elderly persons who are asymptomatic do not have an infection and do not require antibiotic therapy even though they may have bacteria in the urine.

The most common reason for inappropriate use of antibiotics in continuing care is treatment of asymptomatic bacteriuria. *Antibiotics, whether taken for the right or wrong reasons, are not without risk.* Receipt of antibiotics is associated with increased likelihood of carriage and/or infection with resistant organisms. As a consequence, subsequent infections might be difficult or impossible to treat. This risk is a serious side effect of antibiotic use and can persist for many months after antibiotic use has stopped.

Use of antibiotics to treat abnormal urine characteristics

- Foul smell is not an indicator of UTI and can be caused by many factors including poor hygiene, diet or dehydration.
- Abnormal color is not suggestive of a UTI. A UTI should be suspected only if the resident is symptomatic.
- Gross hematuria is usually not caused by a UTI, but rather by other factors. Consider alternate diagnoses.

Remember

UTIs are the most common infection among residents in continuing care centres. Proper diagnosis requires assessment of the resident for the presence of typical symptoms. Laboratory testing is indicated for residents with typical symptoms of a UTI. Urine C&S and creatinine clearance results should be used to guide antibiotic selection and dosing.

For medically stable residents with non-specific changes in functional or mental status, push fluids for 24-hours and reassess; antibiotics can be safely delayed during this period of observation to see if symptoms resolve or if typical symptoms develop.

Asymptomatic bacteriuria is common in the elderly. Antibiotic therapy is not indicated unless typical symptoms of a UTI are present.

Diagnosis of UTIs in the elderly can be challenging. Careful assessment and good communication among nurses, pharmacists and physicians will ensure optimal care for residents with suspected UTIs.

PROGRAM AND AUTHORS

Do Bugs Need Drugs? is a community education program about the wise use of antibiotics. This article coincides with publication of a new Clinical Practice Guideline and Care Pathway for UTIs in long term care by the Towards Optimized Practice program in Alberta. Mary Carson is the Program Director for Do Bugs Need Drugs? Sara Gallinger is an Infection Control Practitioner and Sandra Leung is an Assistant Pharmacy Manager with Alberta Health Services, Integrated Facility Living.

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