

Urinary tract infections (UTI)

Resident with suspected urinary tract infection (UTI): see [when to suspect a UTI](#) (practice point 1)

1. Where the resident presents with fever and / or delirium, isolate the resident and place under [standard and transmission-based precautions](#) until GP review and confirmation of UTI as the cause
 - Apply appropriate personal protective equipment (PPE)
 - Ensure implementation of [enhanced environmental hygiene](#)
2. Check vital signs (review [Recognition of the deteriorating resident](#))
3. If not immediately life-threatening review [Checklist for contact](#) and ring GP*

UNSTABLE VITALS

Review Advance Care Plan or Statement of Choices and refer to [Management of residents with unstable vital signs](#)

1. Commence **oral antibiotics** with choice influenced by type of UTI, allergies and prior organism sensitivities (see [antibiotic selection in UTI](#) - practice point 5)
2. Institute [supportive cares](#) (see practice point 4) including:
 - **Analgesia** as required
 - Note: Increased falls risk may occur due to urgency / frequency / delirium - **increase supervision and modify environment to reduce risk of falls** - see [escalation criteria](#) (practice point 7)
3. **Monitor for systemic symptoms** or change in vital signs (four times daily vital signs for 72 hours)



Is there development of [escalation criteria](#) (practice point 7) including **vomiting or rigors or failure to respond to oral antibiotics by 72 hours OR development of unstable vital signs at any time?** (review [Management of residents with unstable vital signs](#))

NO

GP and RACF to continue ongoing care, monitoring and review. Implement [Prevention of UTI strategies](#) - see practice point 6.

STABLE VITALS

Does resident meet criteria to check for a UTI? (see [when to suspect a UTI](#) - practice point 1)

NO

Look for alternate cause of symptoms and **do not** send urine sample for culture

If no alternate cause of symptoms found, refer to [HHS RaSS](#) at GP discretion

YES

1. If indwelling catheter (IDC) or suprapubic catheter (SPC) present, seek GP authorisation to change catheter
2. Obtain midstream urine sample for m/c/s (see [Urine collection for microscopy, culture and sensitivities](#) - practice point 3)
3. Assess resident for sepsis and type of UTI (see [Assessment of residents with suspected UTI](#) - practice point 2)

Is there either ongoing **vomiting** or **rigors** (uncontrolled shivering / shaking)?

NO

YES

Refer to [HHS RaSS](#) at GP discretion

*Where feasible, tele-conference or video-conference with GP is preferred

Urinary tract infections (UTI) practice points

1) When to suspect a UTI

ONLY check for a UTI if the resident has either:

1. Acute onset of dysuria (burning or stinging when passing urine) **OR**
2. The resident has two or more criteria for a UTI (at least one of which is a major criterion) or if the resident has an IDC or SPC at least one criteria of:

Major criteria:

- **FEVER** (where this is defined as a single oral temperature of > 38 degrees Celsius or an increase in temperature >1.5 degrees Celsius over resident's baseline temperature Note fever may be absent in frail older persons or immunocompromised persons)
- **Delirium** without another cause

Minor criteria:

- New or worsening **urgency** or **frequency**
- **Suprapubic** or **flank** pain or tenderness
- Gross **haematuria** (blood stained urine) without another cause
- New or worsening urinary **incontinence**
- **Rigors** (uncontrollable shivering or shaking)

**** Urine odour and appearance are not predictive of UTI**

**** Do not screen urine in asymptomatic residents** because residents in aged care facilities have high rates of abnormal dipsticks without UTI necessarily being present

**** Do not screen urine based on an isolated episode of behavioural change**

**** Multiple randomised trials have shown no benefit by treating asymptomatic bacteriuria**

2) Assessment of resident with suspected UTI

Assessment of resident with suspected UTI involves assessment to:

1. confirm meets clinical criteria to test for UTI (see practice point 1 - [When to suspect UTI](#))
2. Identify sepsis or unstable vital signs
3. Determine type of UTI:

Assess for underlying functional or anatomical abnormality:

- **Uncomplicated UTI** is a UTI with no underlying abnormality of the urinary tract
- **Complicated UTI** is a UTI with functional or anatomical abnormality of the urinary tract e.g. bladder or ureteric stones, neurogenic bladder, prostatic hypertrophy, phimosis or paraphimosis with associated obstruction of flow

Assess for location of UTI:

- Cystitis = infection localised to bladder
- Pyelonephritis = infection involves kidney
- Prostatitis = infection involves prostate gland

4. Identify and treat precipitants (see practice point 6 - [Prevention of UTI](#))

3) Urine collection for microscopy, culture or sensitivities

- In males and females midstream urine collection should involve prior cleansing of the genitalia
- Females should be instructed to hold labia apart during sampling
- Use of catheterisation is associated with lower rates of contaminated urines on microscopy and culture but may cause harm and distress - use of catheterisation should be limited to those with significant cognitive impairment who are not able to undertake a midstream urine
- Catheter insertion for purposes of urine sample collection should be restricted to an in-out catheter unless there is a concurrent acute urinary retention
- For residents with a long-term indwelling catheter (urethral or suprapubic), it is important to remove the catheter and insert a new catheter prior to collection of urine from the new catheter via the sampling port to test for UTI

Urinary tract infections (UTI) practice points (cont'd)

4) Supportive care for residents with UTI

Supportive care of residents with UTI is critical to optimising resident outcomes and should include:

1. **Identification and treatment of direct complications of infection, particularly development of sepsis (infection with end-organ dysfunction)**
 - Arrange medical review by residents GP
 - Institute regular monitoring of vital signs (minimum four times a day for 72 hours) - notify GP or at GP discretion, the [HHS RaSS](#) team if vital signs suggest clinical deterioration (review [Recognition of the deteriorating resident](#))
2. **Anticipate, prevent or treat destabilisation of chronic diseases** with examples of actions including:
 - Enact diabetes sick-day plan - refer to National Diabetes Services Scheme [Diabetes management in aged care handbook](#)
 - Monitor blood glucose levels closely in diabetics, chronic liver disease or in those with reduced oral intake
 - Attention to fluid balance in those with congestive cardiac failure or renal disease
 - Review medications and with-hold where indicated e.g. consider with-holding diuretics and SGLT-2 inhibitors if clinically dehydrated
3. **Prevent, identify and treat health-care related complications of acute illness**
 - Implement strategies to prevent, identify and treat delirium
 - Institute falls risk management strategies
 - Encourage oral fluids to minimise dehydration
 - Institute turns once every 2 hours and individualised skin care regimen where mobility is reduced
 - Ensure mobility is maintained (with physiotherapy support if indicated) where clinically appropriate

5) Antibiotic selection in a UTI (review [Fever or suspected infection pathway](#) for principles of prescribing)

Modify empirical antibiotic therapy based on urine culture results

If diagnostic criteria for UTI met and there are no features of pyelonephritis or prostatitis suspect CYSTITIS:

- For empirical therapy of uncomplicated cystitis:
 - Nitrofurantoin 100mg orally with food or milk to reduce nausea, 6 hourly for 5 days in females or for 7 days in males
 - Cautious, short-term use of nitrofurantoin may be considered in residents with mild renal impairment and an estimated glomerular filtration rate (eGFR) of 30 to 60mL / minute
 - Avoid in those using concurrent urinary alkalisers (e.g. URAL), which may reduce effectiveness of nitrofurantoin
 - Where nitrofurantoin cannot be used, use:
 - Cefalexin 500mg orally every 12 hours for 5 days in females or for 7 days in males
 - If there is a catheter-associated UTI, change catheter and use 7 days of antibiotics or if symptoms slow to respond, treat for 10 to 14 days

If diagnostic criteria for UTI are accompanied by flank tenderness, suspect PYELONEPHRITIS:

- For empirical therapy of non-severe pyelonephritis use:
 - If NO penicillin allergy use:
 - Amoxicillin and clavulanate 875mg + 125mg orally every 12 hours for 14 days (give with food to improve absorption)
 - If penicillin hypersensitivity use:
 - Ciprofloxacin 500mg orally every 12 hours for 7 days - if eGFR < 30mL / min review [Therapeutic Guidelines: antibiotic](#) for dosing guidance
 - Note - ciprofloxacin is absorbed best if taken 1 hour before or 2 hours after meals; residents should drink plenty of fluids where clinically appropriate while taking ciprofloxacin
 - Avoid urinary alkalisers (e.g. URAL) due to increased risk of crystalluria
 - Avoid dairy products, iron, zinc or calcium supplements and aluminium or magnesium-containing antacids as these may reduce absorption of ciprofloxacin

In males, if diagnostic criteria for UTI are accompanied by systemic features and either perineal pressure or prostate tenderness on gentle rectal examination, suspect PROSTATITIS:

- For empirical therapy of non-severe acute bacterial prostatitis:
 - Trimethoprim 300mg orally daily for 14 days - if eGFR < 30mL / minute review [Therapeutic Guidelines: antibiotic](#) for dosing guidance
 - Note - if resident has had trimethoprim in prior 3 months or if history of trimethoprim-resistant E.coli, instead use:
 - Cefalexin 500mg orally every 6 hours for 14 days

Urinary tract infections (UTI) practice points (cont'd)

6) Prevention of UTI

- Avoid condom catheters
- Review the indication for indwelling catheters regularly and remove for trial of void where no longer indicated. Note - there is no indication for prophylactic antibiotics administered with IDC change
- Topical vaginal oestrogen may decrease incidence of UTI in post-menopausal women
- Where UTIs are recurrent, arrange a ultrasound of the bladder and renal tract to exclude bladder stones, incomplete bladder emptying or other structural or functional abnormality and seek urological or infectious diseases opinion as indicated
- Seek pharmacy review to identify any potential medications that could increase the risk of UTI e.g. SGLT2 inhibitors
- Where clinically appropriate, encourage residents to increase fluid intake and avoid dehydration

7) Escalation criteria

History:

- Symptoms:
 - Uncontrolled pain
 - Vomiting
 - Anuria (or failure to pass urine)
- Comorbidities that require stabilisation or presence of:
 - Immunocompromise
 - Renal failure

Examination:

- Vital signs: unstable vital signs and / or altered mental status (different to usual), where goals of care are active (review [Recognition of the deteriorating resident](#))
- Rigors (uncontrollable shivering)
- Failure to respond to oral antibiotics within 72 hours

Urinary tract infections (UTI) references

1. Antibiotic Expert Groups, Therapeutic Guidelines: Antibiotics. Melbourne: Therapeutic Guidelines limited; 2019.
2. Loeb M, Bentley DW, Bradley S, Crossley K, Garibaldi R, Gantz N, et al. 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(2):120-4.
3. Bader MS, Loeb M, Leto D, Brooks AA. Treatment of urinary tract infections in the era of antimicrobial resistance and new antimicrobial agents. *Postgrad Med*. 2020;132(3):234-50.
4. Loeb M, Brazil K, Lohfeld L, McGeer A, Simor A, Stevenson K, et al. Effect of a multifaceted intervention on number of antimicrobial prescriptions for suspected urinary tract infections in residents of nursing homes: cluster randomised controlled trial. *BMJ*. 2005;331(7518):669.
5. Lohfeld L, Loeb M, Brazil K. Evidence-based clinical pathways to manage urinary tract infections in long-term care facilities: a qualitative case study describing administrator and nursing staff views. *J Am Med Dir Assoc*. 2007;8(7):477-84.
6. Rowe TA, Jump RLP, Andersen BM, Banach DB, Bryant KA, Doernberg SB, et al. Reliability of nonlocalizing signs and symptoms as indicators of the presence of infection in nursing-home residents. *Infect Control Hosp Epidemiol*. 2020:1-10.
7. Nicolle LE, Gupta K, Bradley SF, Colgan R, DeMuri GP, Drekonja D, et al. Clinical Practice Guideline for the Management of Asymptomatic Bacteriuria: 2019 Update by the Infectious Diseases Society of America. *Clin Infect Dis*. 2019;68(10):1611-5.
8. Nicolle LE, Mayhew WJ, Bryan L. Prospective randomized comparison of therapy and no therapy for asymptomatic bacteriuria in institutionalized elderly women. *Am J Med*. 1987;83(1):27-33.
9. van Buul LW, Vreeken HL, Bradley SF, Crnich CJ, Drinka PJ, Geerlings SE, et al. The Development of a Decision Tool for the Empiric Treatment of Suspected Urinary Tract Infection in Frail Older Adults: A Delphi Consensus Procedure. *J Am Med Dir Assoc*. 2018;19(9):757-64.
10. Burkett E, Carpenter CR, Arendts G, Hullick C, Paterson DL, Caterino JM. Diagnosis of urinary tract infection in older persons in the emergency department: To pee or not to pee, that is the question. *Emerg Med Australas*. 2019;31(5):856-62.
11. LaRocco MT, Franek J, Leibach EK, Weissfeld AS, Kraft CS, Sautter RL, et al. Effectiveness of Preanalytic Practices on Contamination and Diagnostic Accuracy of Urine Cultures: a Laboratory Medicine Best Practices Systematic Review and Meta-analysis. *Clin Microbiol Rev*. 2016;29(1):105-47.
12. Walker E, Lyman A, Gupta K, Mahoney MV, Snyder GM, Hirsch EB. Clinical Management of an Increasing Threat: Outpatient Urinary Tract Infections Due to Multidrug-Resistant Uropathogens. *Clin Infect Dis*. 2016;63(7):960-5.
13. By the American Geriatrics Society Beers Criteria Update Expert P. American Geriatrics Society 2015 Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. *J Am Geriatr Soc*. 2015;63(11):2227-46.
14. Scott AM, Clark J, Mar CD, Glasziou P. Increased fluid intake to prevent urinary tract infections: systematic review and meta-analysis. *Br J Gen Pract*. 2020;70(692):e200-e7.

Urinary tract infections (UTI) version control

Pathway	Urinary tract infection				
Document ID	CEQ-HIU-FRAIL-00029	Version no.	3.0.1	Approval date	16/03/2022
Executive sponsor	Executive Director, Healthcare Improvement Unit				
Author	Improving the quality and choice of care setting for residents of aged care facilities with acute healthcare needs steering committee				
Custodian	Queensland Dementia Ageing and Frailty Network				
Supersedes	Urinary tract infection V2.0.0				
Applicable to	Residential aged care facility (RACF) registered nurses and general practitioners in Queensland RACFs, serviced by a RACF acute care Support Service (RaSS)				
Document source	Internal (QHEPS) and external				
Authorisation	Executive Director, Healthcare Improvement Unit				
Keywords	Urinary tract infection, UTI, cystitis, pyelonephritis				
Relevant standards	Aged Care Quality Standards Standard 2: ongoing assessments and planning with consumers Standard 3: personal care and clinical care, particularly 3(3) Standard 8: organisational governance				