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# URINARY TRACT INFECTIONS

Urinary tract infection (UTI) is a common problem in residential aged care homes. Prevalence increases with age in both women and men; however, the lifetime incidence for women is 50 times greater than men. One in two women will experience a UTI in their lifetime.

**Definition**

A urinary tract infection is an infection in any part of the urinary system, including kidneys, ureters, bladder and urethra. Most infections involve the lower urinary tract (bladder and urethra). Upper urinary tract infection (urethritis or pyelonephritis) affect the ureters or kidneys.

**Complicated UTIs**

Complicated UTIs are associated with anatomical or functional abnormalities (e.g. catheter use).
UTI in males is much less common due to the longer urethra and antibacterial defences provided by the prostatic fluid. The majority of older men with UTI have underlying urologic abnormalities. Benign prostatic hyperplasia (BPH) can cause an UTI due to obstruction and turbulent urine flow. Traditionally, all UTIs in males were considered complicated.

**Uncomplicated UTIs**

Uncomplicated UTIs occur in a structurally and functionally normal urinary tract. Acute cystitis and pyelonephritis are generally considered uncomplicated in non-pregnant women. Cystitis is an infection of the superficial bladder mucosa. Acute uncomplicated cystitis and pyelonephritis are most commonly caused by Escherichia coli (70% to 90% of cases). Infection with Klebsiella pneumoniae and Proteus mirabilis occur less frequently.

**Risk factors**

Risk factors for kidney infections and UTIs include:

- Female gender
- Diabetes
- Advanced age
- Post-menopausal women
- Pregnancy
- Urinary catheters

Lack of estrogen in post-menopausal women predisposes to atrophic vaginitis resulting in recurrent UTIs.

Diuretic use increases the risk of dehydration, resulting in concentrated urine and less frequent voiding, which supports bacterial growth in the bladder.

**Symptoms**

Symptoms of an UTI include:

- Strong, persistent urge to urinate
- Burning sensation when urinating
- Passing frequent, small amounts of urine
- Cloudy urine
- Blood in the urine
- Strong smelling urine
- Suprapubic pain

Acute cystitis often presents with urinary symptoms which include dysuria, urinary frequency urgency, nocturia, suprapubic pain or tenderness, and occasionally haematuria (blood in urine). Acute dysuria is the most specific symptom in aged care facility residents. Cloudy or malodorous urine is not a reliable sign of UTI.

In general, a UTI is likely in residents without a catheter if the resident has at least two new symptoms, including at least one general symptom (fever and/or mental status change without an alternative explanation), for example, fever and suprapubic pain or tenderness.

Pyelonephritis or kidney infection usually also includes systemic symptoms such as fever, chills, or sepsis. Flank pain, costovertebral pain or tenderness, nausea, and vomiting are also more indicative of upper UTI or pyelonephritis. Pyelonephritis has a higher likelihood of serious complications.

In the older person, confusion or altered mental status may be the only presenting symptom.

**Asymptomatic bacteriuria**

Asymptomatic bacteriuria is common in older persons and women. In residential aged care, asymptomatic bacteriuria is present in at least 40-50% of women and 30-40% of men without chronic indwelling catheters.
Screening is not recommended.

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Because of the risk of antibiotic resistance, asymptomatic bacteriuria should only be treated in certain patient groups such as pregnant women and those undergoing invasive urinary procedures.

Bacteriuria in people with a catheter should only be treated with antibiotics if they complain of symptoms.

**Treatment**

The choice of antibiotic and duration of treatment depends on the patient's gender, confirmed presence of resistant organisms and frequency of infections. Men are recommended to receive a longer course of 7 days, compared with 3 to 5 days for women.

According to the Therapeutic Guidelines, empirical therapy can be used for acute symptomatic uncomplicated cystitis in nonpregnant women, especially for acute dysuria.
Options include:

- Trimethoprim 300mg daily for 3 days
- Nitrofurantoin 100mg 6 hourly for 5 days

Administering trimethoprim at night allows the antibiotic to concentrate in the bladder overnight and increases effectiveness.

If trimethoprim and nitrofurantoin cannot be used, cefalexin 500mg 12-hourly for 5 days is recommended.
If the pathogen is resistant to empirical therapy, alternate antibiotics include:

- Amoxicillin 500mg 8-hourly for 5 days
- Trimethoprim/sulfamethoxazole 160/800mg 12-hourly for 3 days
- Amoxicillin/clavulanate 500/125mg 12-hourly for 5 days

Options for second-line therapy after confirmation with urine culture includes:

- Fosfomycin 3g as single dose
- Norfloxacin 400mg twice daily for 3 days
- Ciprofloxacin 250mg twice daily for 3 days

Quinolone antibiotics such as norfloxacin or ciprofloxacin should be not be used as first-line therapy as their use may lead to resistance.

In men with acute cystitis, a longer duration of treatment is required:

- Trimethoprim 300mg daily for 7 days
- Nitrofurantoin 100mg 6-hourly for 7 days
- Cefalexin 500mg 12-hourly for 7 days

Pyelonephritis is considered non-severe if the person does not have fever (38°C or higher), systemic features (e.g. tachycardia, nausea, vomiting), or sepsis or septic shock.

Non-severe pyelonephritis may be treated with oral antibiotics without hospitalisation. First-line empirical treatment is amoxicillin/clavulanate 875/125mg twice daily for 14 days. Ciprofloxacin 500mg twice daily for 7 days can be used if the person is penicillin hypersensitive.

Trimethoprim is not recommended for empirical treatment. Intravenous antibiotics may be required for severe pyelonephritis.

**Recurrent UTIs**

Recurrent UTIs are defined as at least 2 infections in 6 months or at least 3 infections in one year. In men, chronic bacterial prostatitis is a common cause of recurrent UTI. Prevention of recurrent UTIs in women may use any of the following medicines, usually for 6 months only:

- Trimethoprim 150mg at night
- Cefalexin 250mg at night
- Nitrofurantoin 50mg at night

Long-term use of nitrofurantoin associated with increased risk of rare adverse effects, including pulmonary toxicity, hepatotoxicity and peripheral polyneuropathy.
Intravaginal or topical estrogen in postmenopausal women may be effective in reducing recurrent UTIs.
Examples include:

- Oestriol 1mg/g cream (Ovestin) once or twice weekly
- Oestriol pessary 500mcg (Ovestin Ovula) once or twice weekly
- Oestradiol pessary 10mcg (Vagifem Low) twice weekly

**Summary**

Urinary tract infections are a common problem for residents in residential aged care homes. Antimicrobial therapy is indicated only for treatment of symptomatic urinary infection. Recurrent asymptomatic bacteriuria is not a UTI and does not require antibiotic therapy.
Overtreatment with antibiotics is common and can contribute to antimicrobial resistance.

***References***

***Therapeutic Guidelines Ltd (eTG March 2020 edition)***

***N Engl J Med 2016; 374:562-571.***

***Aust Prescr 2014;37:7–9.***

***NPS MedicineWise website***