

# CATHETER-ASSOCIATED URINARY TRACT INFECTIONS (CA-UTI) V2.2

## Scope of Guidance

This guideline does not cover CA-UTI in pregnant patients or CA-UTI in children. These are considered complicated cases and should be referred to secondary care.

## Comments from the Expert Advisory Group

- CA-UTI refers to UTIs occurring in persons whose urinary tract is currently catheterised or has been catheterised within the past 48 hours.
- The duration of catheterisation is the most important risk factor for development of a CA-UTI.
- CA-UTIs are often poly-microbial and may be caused by multi drug resistant organisms.
- NB indwelling urethral or suprapubic catheters often become colonised with bacteria, without signs or symptoms of infection in the patient. Antibiotic treatment is of no benefit in these patients.
- Consider referring patients with CA-UTI to hospital if:
  - Patient is significantly dehydrated or unable to take oral fluids and medicines.
  - Child/ young person <16 years with CA-UTI
  - Aged 16 years and over with CA-UTI and severe systemic infection.
  - Patient is pregnant.
  - Patient has a higher risk of developing complications (e.g. people with known or suspected structural or functional abnormality of the genitourinary tract or underlying disease [such as diabetes or immunosuppression]).

## Diagnosis of CA-UTI

✓ Should be based on a full clinical assessment.

✓ Consider CA-UTI in the presence of 1 or more of:

- New suprapubic/ flank pain
- Visible haematuria
- New onset or worsening delirium/ debility/ confusion/ agitation/ functional deterioration
- Fever / shaking / chills

✗ Cloudy urine is NOT an indicator of CA-UTI in the absence of symptoms and signs of a UTI

✗ Foul-smelling urine is NOT an indicator of CA-UTI in the absence of symptoms and signs of a UTI

- For adults with a urinary catheter, a decision aid for management of suspected UTI in community settings has been developed to aid diagnosis and management of CA-UTI. [Decision Aid for management of suspected UTI in community settings: for adults aged 65 years and over or adults with a urinary catheter](#)

✗ Dipstick Urinalysis is not useful in assessing for evidence of UTIs in patients with catheters. For further information please see details in the national [Position Statements Dipstick Urinalysis for UTIs in Adults](#)

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## Empirical treatment of CA-UTI

1. Only consider empiric antibiotic therapy in SYMPTOMATIC patients.
2. If there are no symptoms of upper UTI and patient is systemically well, consider treating as lower UTI.
3. Check the patient's previous culture results and do not use an antibiotic empirically if an organism resistant to that antibiotic has recently been cultured (within 12 weeks).
4. Review urine culture result when available and consider modifying treatment accordingly.

## Cultures

Send urine to the lab only in patients where CA-UTI is suspected on clinical grounds. A urine specimen for culture should be obtained if possible prior to initiating antimicrobial therapy for presumed CA-UTI. The results can be used to guide treatment should the patient fail to respond to empiric choice antibiotic. Refer to [guidance on obtaining a urine sample from a urinary catheter](#). Urinary catheters are often colonised with bacteria. Laboratory microscopy should not be used to diagnose a CA-UTI as urine white cells are often elevated due to the presence of the catheter. A positive urine culture result in a catheterised patient does not always indicate infection and should not be treated unless there are signs or symptoms suggestive of CA-UTI (such as suprapubic/ flank pain, fever).

In the presence of a urinary catheter, antibiotics will not eradicate bacteriuria.

## Other considerations in management of CA-UTI

- Delayed response
  - NB Check urine culture results (usually available 3-4 days after sending urine). Failure to respond or delayed response may be due to a resistant organism.
  - If there is a delayed response despite a susceptible organism, consider referral for further investigations (e.g. renal ultrasound), if appropriate. 10 to 14 days treatment may be necessary if there is a delayed response to treatment and the organism is susceptible.
- Review ongoing need for the catheter. In CA-UTI, a change of catheter should be considered whilst on treatment.
- [Refer to the HPSC Guidelines for the prevention of catheter-associated urinary tract infection](#).
- Adequate hydration is important to reduce risk of CA-UTI.
- Consider discussion with local clinical microbiologist particularly for complex patients or those with previous resistant organisms.

## Antibiotic Prophylaxis and CA-UTI

- **X** Long-term antibiotic prophylaxis is generally not appropriate for the prevention of UTI in catheterised patients due to the risk of antibiotic-associated harm to the patient such as adverse events and antimicrobial resistance.
- Antibiotic prophylaxis for urinary catheter changes is NOT appropriate unless there is a definite history of UTIs due to catheter change.

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## Treatment

LOWER CA-UTI ( <u>NOT</u> SYSTEMICALLY UNWELL) EMPIRIC TREATMENT TABLE			
Drug	Dose	Duration	Notes
<b>1<sup>st</sup> Choice Options</b>			
Nitrofurantoin <b>Immediate release</b> Capsules <b>OR</b>	50 mg every 6 hours	7 days	Nitrofurantoin is NOT a suitable antibiotic choice in Upper CA-UTI or if patient systemically unwell.  Nitrofurantoin poorly penetrates the prostate. Consider prostatitis as a diagnosis in males if symptoms persist.
Nitrofurantoin <b>Prolonged release</b> Capsules	100 mg every 12 hours	7 days	Contraindicated in patients with eGFR <30 mL/min/1.73 m <sup>2</sup> Immediate/ prolonged release should be stated on the prescription (see note below on formulation difference)
<b>2<sup>nd</sup> Choice Options</b> (Only use when nitrofurantoin is unsuitable)			
Cefalexin <b>OR</b>	500 mg every 12 hours	7 days	Cephalosporins should not be used in severe penicillin allergy.
Trimethoprim	200 mg every 12 hours	7 days	Use only when risk of resistance is low i.e. where previous culture suggests susceptibility (but trimethoprim was not used) or in younger patients without a significant antibiotic exposure history. Risk of resistance is more likely in older people in residential facilities.

UPPER CA-UTI (SYSTEMICALLY UNWELL) TREATMENT TABLE			
Drug	Dose	Duration*	Notes
<b>1<sup>st</sup> Choice Option</b>			
Cefalexin	500 mg every 8 hours (can increase to 1 g every 6 hours in severe infection)	7 - 10 days*	Cephalosporins should not be used in severe penicillin allergy.
<b>2<sup>nd</sup> Choice Option</b>			
Co-Amoxiclav	Co-amoxiclav 875/125 mg every 8 hours**	7 - 10 days*	Avoid in penicillin allergy. Use only when risk of resistance is low i.e. where previous culture suggests susceptibility (but this was not used) or in younger patient without a significant antibiotic exposure history. Risk of resistance is more likely in older people in residential facilities.
<b>Penicillin Allergy</b>			
Trimethoprim	200 mg every 12 hours	14 days	Use only when risk of resistance is low i.e. where previous culture suggests susceptibility (but this was not used) or in younger patient without a significant antibiotic exposure history. Risk of resistance is more likely in older people in residential facilities.
Ciprofloxacin	500 mg every 12 hours	7 days*	Reserve for severe penicillin allergy or where other antibiotics not suitable. Avoid ciprofloxacin in pregnancy. Multiple adverse effects associated with fluroquinolones.

\*10 to 14 days treatment may be necessary if there is a delayed response to treatment and the organism is susceptible.

\*\* A higher dose of co-amoxiclav (875/125 mg) every 8 hours is recommended for treatment of upper CA-UTI (875/125mg = 875 mg amoxicillin plus 125 mg clavulanic acid)

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## Some considerations for antibiotic choice:

Provided it is not contra-indicated, **nitrofurantoin** is the preferred first choice for lower CA-UTI where patient is not systemically unwell. Nitrofurantoin resistance rates remain low in community *E. coli* UTIs throughout Ireland (including in ESBL-producing isolates) despite increasing resistance to other antibiotics.

### Nitrofurantoin precautions

1. Tissue concentrations are too low for treatment of systemic infection, including pyelonephritis. It is only suitable for uncomplicated lower urinary tract infection and in lower CA-UTI where the patient is systemically well.
2. Nitrofurantoin has poor penetration in the prostate. Consider prostatitis as a diagnosis in males if symptoms persist.
3. Nitrofurantoin should *not* be used in patients with severe renal impairment (CKD Stage 4/5, eGFR <30 mL/min/1.73m<sup>2</sup>, Creatinine Clearance <30 mL/min) because of diminished urinary tract concentrations and increased risk of toxicity. Nitrofurantoin may be used with caution (as short-course therapy only) if there is a lesser degree of renal impairment (eGFR greater than 30 mL/min/1.73m<sup>2</sup>) to treat suspected or proven resistant pathogens, when the benefits are expected to outweigh the risks. In frail elderly patients with poor fluid intake and an infection, creatinine levels may deteriorate quickly so if a patient is dehydrated then established renal impairment may be further compromised.
4. Two nitrofurantoin formulations are available: nitrofurantoin immediate release capsules (MacroDantin®) and nitrofurantoin prolonged release capsules (MacroBid®). For the treatment of infection the prolonged release **MacroBid®** capsules are dosed twice daily whilst the standard **MacroDantin®** capsules are dosed four times daily. As ADVANZ PHARMA is the sole supplier of these products in Ireland, a stock management plan has been introduced to ensure patients in Ireland have access to these important medicines. Should any customer have difficulty in getting supply, ADVANZ PHARMA have advised pharmacists to contact their customer service line on +353 15294230 to allow them to assist in meeting patients' needs.

There is data to indicate that the rate of **trimethoprim** resistance in *E. coli* in community urinary samples is high in particular in older people in residential care facilities. Empiric trimethoprim is therefore no longer recommended except where nitrofurantoin is unsuitable and the risk of resistance is low (e.g. where a previous urine culture has had a trimethoprim-susceptible isolate and trimethoprim has not been used, or in a young patient without a significant antibiotic exposure history).

**Amoxicillin** is **not** recommended as empiric therapy, as resistance rates in community *E. coli* UTIs are extremely high. Only use if amoxicillin susceptibility known.

**Co-amoxiclav** resistance in *E. coli* in community urine samples is high. In addition, it is a systemic agent and should be avoided in uncomplicated CA-UTI if a locally acting agent (e.g. nitrofurantoin) could be used instead.

**Ciprofloxacin** is a broad-spectrum antibiotic, associated with *C. difficile* infection and multiple adverse effects. It is not recommended for the empiric treatment of uncomplicated lower CA-UTI where patient is systemically well. It may be considered for targeted therapy of multi-resistant infections, where there are no other appropriate options.

## Patient Information

- [HSE A-Z: Urinary catheter](#)