UTI (lower): antimicrobial prescribing

NICE National Institute for Health and Care Excellence

Lower urinary tract infection (UTI)

Non-pregnant woman

Give advice about managing symptoms with self-care

Pregnant woman, or

Man, or

Child or young person under 16 years

Consider a back-up antibiotic prescription or immediate antibiotic, noting that the evidence for back-up antibiotics was from women not needing immediate treatment

If urine sent for culture and susceptibility, and antibiotic given:

- review antibiotic choice when results available, and
- change antibiotic for pregnant women if bacteria resistant
- change antibiotic for children and young people, men and non-pregnant women if bacteria resistant and symptoms not improving

Use a narrow spectrum antibiotic when possible

- Send midstream urine for culture and susceptibility for pregnant women and men
- Send urine for culture and susceptibility or dipstick in line with the NICE guideline on urinary tract infection for under 16s
- Offer immediate antibiotic
- Assess and manage fever in under 5s in line with the NICE guideline on fever in under 5s

With all antibiotic prescriptions, advise:

- possible adverse effects of antibiotics include diarrhoea and nausea
- seeking medical help if symptoms worsen at any time, do not improve within 48 hours of taking the antibiotic, or the person becomes very unwell

With a back-up antibiotic prescription, also advise:

- antibiotic is not needed immediately
- use prescription if no improvement in 48 hours or symptoms worsen at any time

Reassess at any time if symptoms worsen rapidly or significantly or do not improve in 48 hours of taking antibiotics, sending a urine sample for culture and susceptibility if not already done. Take account of:

- other possible diagnoses
- any symptoms or signs suggesting a more serious illness or condition
- previous antibiotic use, which may have led to resistance

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Refer to hospital if a person aged 16 or over has any symptoms or signs suggesting a more serious illness or condition (for example, sepsis)

Refer children and young people to hospital in line with the NICE guideline on urinary tract infection in under 16s

Background

- Lower UTI (cystitis) is a bladder infection usually caused by bacteria travelling up to the urethra from the gastrointestinal tract

Self-care

- Advise paracetamol for pain or, if preferred and suitable, ibuprofen
- Advise drinking enough fluid to avoid dehydration
- No evidence found for cranberry products or urine alkalinising agents to treat lower UTI

Antibiotics

- When considering antibiotics, take account of severity of symptoms, risk of complications, previous urine culture and susceptibility results, previous antibiotic use which may have led to resistant bacteria and local antimicrobial resistance data

Asymptomatic bacteriuria

- Asymptomatic bacteriuria is significant levels of bacteria in urine with no UTI symptoms
- Treated in pregnant women because risk factor for pyelonephritis and premature delivery
- Not screened for or treated in non-pregnant women, men, children or young people

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NICE uses 'offer' when there is more certainty of benefit and 'consider' when evidence of benefit is less clear.

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Choice of antibiotic: non-pregnant women aged 16 years and over

Antibiotic[1]	Dosage and course length[2]
If there are symptoms of pyelonephritis (such as fever) or a complicated UTI, see the NICE guideline on acute pyelonephritis for antibiotic choices	
First choice[3]	
Nitrofurantoin: if estimated glomerular filtration rate (eGFR) ≥45 ml/minute[4]	100 mg modified-release twice a day (or if unavailable, 50 mg four times a day) for 3 days
Trimethoprim: if low risk of resistance[5]	200 mg twice a day for 3 days
Second choice (no improvement in lower UTI symptoms on first choice taken for at least 48 hours, or when first choice not suitable)[3]	
Nitrofurantoin: if eGFR ≥45 ml/minute[4] and not first choice	100 mg modified-release twice a day (or if unavailable, 50 mg four times a day) for 3 days
Pivmecillinam (a penicillin)	400 mg initial dose, then 200 mg three times a day for a total of 3 days
Fosfomycin	3 g single dose sachet

[1]See BNF for use and dosing in specific populations, for example, hepatic impairment, renal impairment and breast-feeding.
[2]Doses given are by mouth using immediate-release medicines, unless otherwise stated.
[3]Check any previous urine culture and susceptibility results and antibiotic prescribing and choose antibiotics accordingly.
[4]May be used with caution if eGFR 30-44 ml/minute to treat uncomplicated lower UTI caused by suspected or proven multidrug resistant bacteria and only if potential benefit outweighs risk (BNF, August 2018).
[5]A lower risk of resistance may be more likely if not used in the past 3 months, previous urine culture suggests susceptibility (but this was not used), and in younger people in areas where local epidemiology data suggest resistance is low. A higher risk of resistance may be more likely with recent use and in older people in residential facilities.

Choice of antibiotic: children and young people under 16 years

Antibiotic[1]	Dosage and course length[2]
If there are symptoms of pyelonephritis (such as fever) or a complicated UTI, see the NICE guideline on acute pyelonephritis for antibiotic choices	
Refer **children under 3 months** to paediatric specialist and treat with intravenous antibiotics in line with the NICE guideline on fever in under 5s	
Children aged 3 months and over - First choice[3, 4]	
Trimethoprim: if low risk of resistance[5]	3 to 5 months, 4 mg/kg (maximum 200 mg per dose) or 25 mg twice a day for 3 days 6 months to 5 years, 4 mg/kg (maximum 200 mg per dose) or 50 mg twice a day for 3 days 6 to 11 years, 4 mg/kg (maximum 200 mg per dose) or 100 mg twice a day for 3 days 12 to 15 years, 200 mg twice a day for 3 days
Nitrofurantoin: if estimated glomerular filtration rate (eGFR) ≥45 ml/minute[6]	3 months to 11 years, 750 micrograms/kg four times a day for 3 days 12 to 15 years, 50 mg four times a day or 100 mg modified-release twice a day for 3 days
Children aged 3 months and over - Second choice (worsening lower UTI symptoms on first choice taken for at least 48 hours or when first choice not suitable)[3, 4]	
Nitrofurantoin: if eGFR ≥45 ml/minute[6] and not first choice	3 months to 11 years, 750 micrograms/kg four times a day for 3 days 12 to 15 years, 50 mg four times a day or 100 mg modified-release twice a day for 3 days
Amoxicillin (only if culture results available and susceptible)	1 to 11 months, 125 mg three times a day for 3 days 1 to 4 years, 250 mg three times a day for 3 days 5 to 15 years, 500 mg three times a day for 3 days
Cefalexin	3 to 11 months, 12.5 mg/kg or 125 mg twice a day for 3 days 1 to 4 years, 12.5 mg/kg twice a day or 125 mg three times a day for 3 days 5 to 11 years, 12.5 mg/kg twice a day or 250 mg three times a day for 3 days 12 to 15 years, 500 mg twice a day for 3 days

[1]See BNF for children (BNFC) for use and dosing in specific populations.
[2]Age bands apply to children of average size; in practice the prescriber will use these with other factors. Doses given are by mouth using immediate release medicines, unless otherwise stated.
[3]Check previous urine culture and susceptibility results and antibiotic prescribing. If receiving prophylactic antibiotics, treatment should be with a different antibiotic.
[4]If 2 or more antibiotics are appropriate, choose the one with the lowest acquisition cost. Some children may also be able to take a tablet or part-tablet, rather than a liquid formulation if the dose is appropriate.
[5]A lower risk of resistance may be more likely if not used in the past 3 months, previous urine culture suggests susceptibility (but this was not used), and in younger people in areas where data suggest resistance is low. Risk of resistance may be higher with recent use and in older people in care homes.
[6]May be used with caution if eGFR 30–44 ml/minute to treat uncomplicated lower UTI caused by suspected or proven multidrug resistant bacteria and only if potential benefit outweighs risk (BNFC, August 2018).

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Choice of antibiotic: pregnant women aged 12 years and over

Antibiotic[1]	Dosage and course length[2]
If there are symptoms of pyelonephritis (such as fever) or a complicated UTI, see the NICE guideline on acute pyelonephritis for antibiotic choices	
First choice for treating lower UTI[3]	
Nitrofurantoin (avoid at term): if estimated glomerular filtration rate (eGFR) ≥45 ml/minute[4, 5]	100 mg modified-release twice a day (or if unavailable, 50 mg four times a day) for 7 days
Second choice for treating lower UTI (no improvement in lower UTI symptoms on first choice taken for at least 48 hours or when first choice not suitable)[3]	
Amoxicillin (only if culture results available and susceptible)	500 mg three times a day for 7 days
Cefalexin	500 mg twice a day for 7 days
Alternative second choices	Consult local microbiologist, choose antibiotics based on culture and susceptibility results
Treating asymptomatic bacteriuria	
Choose from nitrofurantoin[4, 5], amoxicillin or cefalexin based on recent culture and susceptibility results	

[1]See BNF for appropriate use and dosing in specific populations, for example, hepatic impairment and renal impairment.
[2]Doses given are by mouth using immediate-release medicines, unless otherwise stated.
[3]Check any previous urine culture and susceptibility results and antibiotic prescribing and choose antibiotics accordingly.
[4]Avoid at term in pregnancy; may produce neonatal haemolysis (BNF, June 2018).
[5] May be used with caution if eGFR 30–44 ml/minute to treat uncomplicated lower UTI caused by suspected or proven multidrug resistant bacteria and only if potential benefit outweighs risk (BNF, August 2018).

Choice of antibiotic: men aged 16 years and over

Antibiotic[1]	Dosage and course length[2]
If there are symptoms of pyelonephritis (such as fever) or a complicated UTI, see the NICE guideline on acute pyelonephritis for antibiotic choices	
First choice[3]	
Trimethoprim	200 mg twice a day for 7 days
Nitrofurantoin: if estimated glomerular filtration rate (eGFR) ≥45 ml/minute[4, 5]	100 mg modified-release twice a day (or if unavailable, 50 mg four times a day) for 7 days
Second choice (no improvement in UTI symptoms on first choice taken for at least 48 hours or when first choice not suitable)[3]	
Consider alternative diagnoses and follow recommendations in the NICE antimicrobial prescribing guidelines on acute pyelonephritis or acute prostatitis, basing antibiotic choice on recent culture and susceptibility results.	

[1]See BNF for appropriate use and dosing in specific populations, for example, hepatic impairment and renal impairment.
[2]Doses given are by mouth using immediate-release medicines, unless otherwise stated.
[3]Check any previous urine culture and susceptibility results and antibiotic prescribing and choose antibiotics accordingly.
[4]Nitrofurantoin is not recommended for men with suspected prostate involvement because it is unlikely to reach therapeutic levels in the prostate.
[5]May be used with caution if eGFR 30–44 ml/minute to treat uncomplicated lower UTI caused by suspected or proven multidrug resistant bacteria and only if potential benefit outweighs risk (BNF, August 2018).