# UTI (catheter): antimicrobial prescribing

**Presentation: catheter-associated urinary tract infection**

- Consider removing or, if not possible, changing the catheter if it has been in place for more than 7 days, but do not delay antibiotic treatment
- Send a urine sample for culture and susceptibility testing
- Offer an antibiotic
- Advise managing symptoms with self care

Advise:

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

When results of urine culture are available:

- review the choice of antibiotic, and
- change antibiotic according to susceptibility results if bacteria are resistant, using a narrow spectrum antibiotic when possible

Reassess at any time if symptoms worsen or do not start to improve within 48 hours, taking account of:

- other possible diagnoses
- any symptoms or signs suggesting a more serious illness or condition, such as sepsis
- previous antibiotic use, which may have led to resistant bacteria

**Refer to hospital** if the person has any symptoms or signs of a more serious illness or condition (for example, sepsis)

Consider referring or seeking specialist advice for people if they:

- are significantly dehydrated or unable to take oral fluids and medicine
- are pregnant
- have a higher risk of complications
- have recurrent catheter-associated UTIs
- have bacteria resistant to oral antibiotics

**Prevention**

- Do not routinely offer antibiotic prophylaxis to people with a short-term or long-term catheter
- Advise seeking medical help if symptoms of acute UTI develop

**Background**

- Catheter-associated UTI is a symptomatic bladder or kidney infection in a person with a catheter
- Bacteria are more likely to be present in urine the longer a catheter is in place (after 1 month most people have bacteriuria)
- Antibiotic treatment is not routinely needed for asymptomatic bacteriuria in people with a catheter

**Self-care**

- Advise paracetamol for pain
- Advise drinking enough fluids to avoid dehydration

**Antibiotics**

- When prescribing 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
- Give oral antibiotics first-line if people can take oral medicines, and the severity of their condition does not require intravenous antibiotics
- Review intravenous antibiotics by 48 hours and consider stepping down to oral antibiotics where possible

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# UTI (catheter): antimicrobial prescribing

| Choice of antibiotic for non-pregnant women and men aged 16 years and over | |
|---|---|
| **Antibiotic** | **Dosage and course length** |
| First-choice oral antibiotics if no upper UTI symptoms | |
| **Nitrofurantoin (if eGFR 45 ml/min or more)** | 100 mg modified-release twice a day (or if unavailable, 50 mg four times a day) for 7 days |
| **Trimethoprim (if low risk of resistance)** | 200 mg twice a day for 7 days |
| **Amoxicillin (only if culture results available and susceptible)** | 500 mg three times a day for 7 days |
| Second-choice oral antibiotic if no upper UTI symptoms (when first choice not suitable) | |
| **Pivmecillinam (a penicillin)** | 400 mg initial dose then 200 mg three times a day for a total of 7 days |
| First-choice oral antibiotics if upper UTI symptoms | |
| **Cefalexin** | 500 mg twice or three times a day (up to 1 to 1.5 g three or four times a day for severe infections) for 7 to 10 days |
| **Co-amoxiclav (only if culture results available and susceptible)** | 500/125 mg three times a day for 7 to 10 days |
| **Trimethoprim (only if culture results available and susceptible)** | 200 mg twice a day for 14 days |
| **Ciprofloxacin (only if other first-choice antibiotics are unsuitable)** ! | 500 mg twice a day for 7 days |

| Choice of antibiotic for non-pregnant women and men aged 16 years and over, continued | |
|---|---|
| **Antibiotic** | **Dosage and course length** |
| First-choice intravenous antibiotics (if vomiting, unable to take oral antibiotics, or severely unwell). Antibiotics may be combined if susceptibilty or sepsis is a concern | |
| **Co-amoxiclav (only in combination or if culture results available and susceptible)** | 1.2 g three times a day |
| **Cefuroxime** | 750 mg to 1.5 g three or four times a day |
| **Ceftriaxone** | 1 to 2 g once a day |
| **Gentamicin** | Initially 5 mg/kg to 7 mg/kg once a day, subsequent doses adjusted according to serum gentamicin concentration |
| **Amikacin** | Initially 15 mg/kg once a day (maximum per dose 1.5 g once a day), subsequent doses adjusted according to serum amikacin concentration (maximum 15 g per course) |
| **Ciprofloxacin (only if other first-choice antibiotics are unsuitable)** ! | 400 mg twice or three times a day |
| Second-choice intravenous antibiotics: consult local microbiologist | |

**Notes**

For **all antibiotics**: see BNF for appropriate use and dosing in specific populations, for example, hepatic impairment, renal impairment, breastfeeding, and administering intravenous antibiotics. Check any previous urine culture and **susceptibility results** and antibiotic prescribing, and choose antibiotics accordingly.

For **intravenous antibiotics**: review by 48 hours and consider stepping down to oral antibiotics where possible.

For **nitrofurantoin**: See the MHRA advice on monitoring for pulmonary and hepatic adverse reactions to nitrofurantoin. This option may be used with caution if eGFR is 30 to 44 ml/min to treat uncomplicated lower UTI caused by suspected or proven multidrug resistant bacteria, and only if potential benefit outweighs risk (see BNF information on nitrofurantoin).

For **nitrofurantoin** and **pivmecillinam**: these options are only licensed for uncomplicated lower UTIs, and are not suitable for people with upper UTI symptoms or a blocked catheter.

For **trimethoprim**: a lower risk of resistance is 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 suggests low resistance. Higher risk of resistance is likely with recent use and in older people in care homes.

! **Warning:** for **ciprofloxacin**, see MHRA January 2024 advice for restrictions and precautions for using fluoroquinolone antibiotics because of the risk of disabling and potentially long-lasting or irreversible side effects. These fluoroquinolones must now only be prescribed when other commonly recommended antibiotics are inappropriate.

For **gentamicin** and **amikacin**: therapeutic drug monitoring and assessment of renal function is required for adjusting doses (see BNF information on gentamicin and BNF information on amikacin).

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# UTI (catheter): antimicrobial prescribing

| Choice of antibiotic for pregnant women aged 12 years and over | |
|---|---|
| **Antibiotic** | **Dosage and course length** |
| First-choice oral antibiotic | |
| **Cefalexin** | 500 mg twice or three times a day (up to 1 to 1.5 g three or four times a day for severe infections) for 7 to 10 days |
| First-choice intravenous antibiotic (if vomiting, unable to take oral antibiotics, or severely unwell) | |
| **Cefuroxime** | 750 mg to 1.5 g three or four times a day |
| Second-choice antibiotics or combining antibiotics if susceptibility or sepsis a concern: consult local microbiologist | |

**Notes**

For **all antibiotics**: see BNF for appropriate use and dosing in specific populations, for example, hepatic impairment, renal impairment, breastfeeding, and administering intravenous antibiotics. Check any previous urine culture and **susceptibility results** and antibiotic prescribing, and choose antibiotics accordingly.

For **intravenous antibiotics**: review by 48 hours and consider stepping down to oral antibiotics where possible.

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# UTI (catheter): antimicrobial prescribing

| Choice of antibiotic for children and young people under 16 years | |
|---|---|
| **Antibiotic** | **Dosage and course length** |
| 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 oral antibiotics | |
| **Trimethoprim (if low risk of resistance)** | 3 to 5 months, 4 mg/kg (maximum 200 mg per dose) or 25 mg twice a day for 7 to 10 days; 6 months to 5 years, 4 mg/kg (maximum 200 mg per dose) or 50 mg twice a day for 7 to 10 days; 6 to 11 years, 4 mg/kg (maximum 200 mg per dose) or 100 mg twice a day for 7 to 10 days; 12 to 15 years, 200 mg twice a day for 7 to 10 days |
| **Amoxicillin (only if culture results available and susceptible)** | 3 to 11 months, 125 mg three times a day for 7 to 10 days; 1 to 4 years, 250 mg three times a day for 7 to 10 days; 5 to 15 years, 500 mg three times a day for 7 to 10 days |
| **Cefalexin** | 3 to 11 months, 12.5 mg/kg or 125 mg twice a day for 7 to 10 days (25 mg/kg two to four times a day [maximum 1 g per dose four times a day] for severe infections)<br>1 to 4 years, 12.5 mg/kg twice a day or 125 mg three times a day for 7 to 10 days (25 mg/kg two to four times a day [maximum 1 g per dose four times a day] for severe infections)<br>5 to 11 years, 12.5 mg/kg twice a day or 250 mg three times a day for 7 to 10 days (25 mg/kg two to four times a day [maximum 1 g per dose four times a day] for severe infections)<br>12 to 15 years, 500 mg twice or three times a day (up to 1 to 1.5 g three or four times a day for severe infections) for 7 to 10 days |
| **Co-amoxiclav (only if culture results available and susceptible)** | 3 to 11 months, 0.25 ml/kg of 125/31 suspension three times a day for 7 to 10 days (dose doubled in severe infection)<br>1 to 5 years, 0.25 ml/kg of 125/31 suspension or 5 ml of 125/31 suspension three times a day for 7 to 10 days (dose doubled in severe infection)<br>6 to 11 years, 0.15 ml/kg of 250/62 suspension or 5 ml of 250/62 suspension three times a day for 7 to 10 days (dose doubled in severe infection)<br>12 to 15 years, 250/125 mg or 500/125 mg three times a day for 7 to 10 days |
| **Children aged 3 months and over**: first-choice intravenous antibiotics (if vomiting, unable to take oral antibiotics or severely unwell). Antibiotics may be combined if susceptibility or sepsis a concern | |
| **Co-amoxiclav (only in combination unless culture results confirm susceptibility)** | 3 months to 15 years, 30 mg/kg three times a day (maximum 1.2 g three times a day) |
| **Cefuroxime** | 3 months to 15 years, 20 mg/kg three times a day (maximum 750 mg per dose), increased to 50 to 60 mg/kg three or four times a day (maximum 1.5 g per dose) for severe infections |
| **Ceftriaxone** | 3 months to 11 years (up to 50 kg), 50 to 80 mg/kg once a day (maximum 4 g per day); 9 to 11 years (50 kg and above), 1 to 2 g once a day; 12 to 15 years, 1 to 2 g once a day |
| **Gentamicin** | Initially 7 mg/kg once a day, subsequent doses adjusted according to serum gentamicin concentration |
| **Amikacin** | Initially 15 mg/kg once a day, subsequent doses adjusted according to serum amikacin concentration |
| **Children aged 3 months and over**: for second-choice intravenous antibiotics, consult local microbiologist | |

**Notes**

See over page.

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# UTI (catheter): antimicrobial prescribing

**Choice of antibiotic for children and young people under 16 years, continued**

**Notes**

For **all antibiotics**: see BNF for children (BNFC) for appropriate use and dosing in specific populations, for example, hepatic impairment, renal impairment, and administering intravenous antibiotics. For prescribing in pregnancy, refer to the table on choice of antibiotic for pregnant women aged 12 and over. Age bands apply to average size and, in practice, age bands will be used with other factors such as the severity of the condition and the child's size. Check any previous urine culture and **susceptibility results** and antibiotic prescribing, and choose antibiotics accordingly. If a child or young person is receiving prophylactic antibiotics, treatment should be with a different antibiotic not a higher dose of the same antibiotic.

For **intravenous antibiotics**: review by 48 hours and consider stepping down to oral antibiotics where possible for a total antibiotic course of 10 days. If intravenous treatment is not possible, consider intramuscular treatment, if suitable.

For **trimethoprim**: a lower risk of resistance is 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 suggests low resistance. Higher risk of resistance is likely with recent use.

For **gentamicin** and **amikacin**: therapeutic drug monitoring and assessment of renal function is required for adjusting doses (see BNFC information on gentamicin and BNFC information on amikacin).

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