



A summary of prescribing recommendations from NICE guidance

This edition includes four antimicrobial prescribing guidelines:

1. Pyelonephritis, 2. Lower urinary tract infection (UTI), 3. Recurrent UTI, 4. Catheter-associated UTI.

1. Pyelonephritis: antimicrobial prescribing

NICE NG111; 2018

This guideline sets out an antimicrobial prescribing strategy for acute pyelonephritis (upper urinary tract infection [UTI]) in children, young people and adults who do not have a catheter. It aims to optimise antibiotic use and reduce antibiotic resistance.

See the [NICE visual summary](#)

Treatment and management

- ◆ Be aware that acute pyelonephritis is an infection of one or both kidneys usually caused by bacteria travelling up from the bladder.
- ◆ In people aged ≥16 years with acute pyelonephritis, obtain a midstream urine sample before antibiotics are taken and send for culture and susceptibility testing.
- ◆ In children and young people <16 years with acute pyelonephritis, obtain a midstream urine sample before antibiotics are taken and send for culture and susceptibility testing – see [NICE Pathway: UTI in under 16s](#).
- ◆ Assess and manage children <5 years who present with fever as outlined in [NICE Pathway: Fever in under 5s](#).

Antibiotic treatment

- ◆ Offer an antibiotic (see [Box 1](#) for choice of antibiotic) to people with acute pyelonephritis.
- ◆ Take account of:
 - severity of symptoms,
 - risk of developing complications, which is higher in people with known or suspected structural or functional abnormality of the genitourinary tract or immunosuppression,
 - previous urine culture and susceptibility results,
 - previous antibiotic use, which may have led to resistant bacteria.
- ◆ When results of urine cultures are available:
 - review choice of antibiotic, **AND**
 - change antibiotic according to susceptibility results if the bacteria are resistant, using a narrow spectrum antibiotic wherever possible.

Box 1:

Choice of antibiotic

Take account of local antimicrobial resistance data and follow the tables in the NICE 3-page [visual summary](#):

- ◆ Table 1 for non-pregnant women and men aged ≥16 years
- ◆ Table 2 for pregnant women aged ≥12 years
- ◆ Table 3 for children and young people aged <16 years

Recommendations – wording used such as ‘offer’ and ‘consider’ denote the [strength of the recommendation](#).

Drug recommendations – the guideline assumes that prescribers will use a drug’s [Summary of Product Characteristics \(SPC\)](#) to inform treatment decisions.

Advice when an antibiotic prescription is given

- ◆ When an antibiotic is given, as well as the general advice on self-care (see [Box 2](#)), give advice about:
 - possible adverse effects of the antibiotic, particularly diarrhoea and nausea,
 - nausea with vomiting also being a possible indication of worsening pyelonephritis,
 - seeking medical help if:
 - ❖ symptoms worsen at any time, **OR**
 - ❖ symptoms do not start to improve within 48 hours of taking the antibiotic, **OR**
 - ❖ the person becomes systemically very unwell.

Box 2:

Self-care

- ◆ Advise people with acute pyelonephritis about using paracetamol for pain, with possible addition of a low-dose weak opioid such as codeine for people >12 years.
- ◆ Advise people with acute pyelonephritis about drinking enough fluids to avoid dehydration.

Reassessment

- ◆ Reassess if symptoms worsen at any time, or do not start to improve within 48 hours of taking the antibiotic.
- ◆ Take account of:
 - other possible diagnoses,
 - any symptoms or signs suggesting a more serious illness or condition (e.g. sepsis),
 - previous antibiotic use, which may have led to resistant bacteria.

Referral and seeking specialist advice

- ◆ Refer people ≥16 years with acute pyelonephritis to hospital if they have any symptoms or signs suggesting a more serious illness or condition (e.g. sepsis).
- ◆ Consider referring or seeking specialist advice for people ≥16 years with acute pyelonephritis if they:
 - are significantly dehydrated or unable to take oral fluids and medicines, **OR**
 - are pregnant, **OR**
 - have 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]).
- ◆ Refer children and young people with acute pyelonephritis to hospital in line with [NICE Pathway: UTI in under 16s](#).

Please go to www.nice.org.uk to check for any recent updates to this guidance.

2. Lower urinary tract infection: antimicrobial prescribing

NICE NG109; 2018

This guideline sets out an antimicrobial prescribing strategy for lower urinary tract infection (UTI), also called cystitis, in children, young people and adults who do not have a catheter. It aims to optimise antibiotic use and reduce antibiotic resistance.

See the NICE [visual summary](#)

Treatment and management

- ◆ Be aware that lower UTI is an infection of the bladder usually caused by bacteria from the gastrointestinal tract entering the urethra and travelling up to the bladder.
- ◆ Give advice about managing symptoms with self-care (see **Box 3**).

Box 3:

Self-care

- ◆ Advise people with lower UTI about:
 - using paracetamol for pain, or ibuprofen if preferred and suitable,
 - drinking enough fluids to avoid dehydration.
- ◆ Be aware that no evidence was found on cranberry products or urinary alkalinising agents to treat lower UTI.

Women who are not pregnant

- ◆ Consider a **back-up** prescription (to use if symptoms do not start to improve within 48 hours or worsen at any time) **OR** an **immediate** antibiotic prescription (see **Box 4**).
- ◆ Take account of:
 - severity of symptoms,
 - risk of developing complications, which is higher in people with known or suspected structural or functional abnormality of the genitourinary tract or immunosuppression,
 - the evidence for back-up antibiotic prescriptions which was only in non-pregnant women with lower UTI where immediate antibiotic treatment was not considered necessary,
 - previous urine culture and susceptibility results,
 - previous antibiotic use, which may have led to resistant bacteria,
 - preference of the woman for antibiotic use.

Men and pregnant women

- ◆ Obtain a midstream urine sample before antibiotics are taken, and send for culture and susceptibility testing.
- ◆ Offer an **immediate** antibiotic prescription (see **Box 4**).
- ◆ Take account of:
 - previous urine culture and susceptibility results,
 - previous antibiotic use, which may have led to resistant bacteria.

Children and young people <16 years

- ◆ Obtain a urine sample before antibiotics are taken, and dipstick test or send for culture and susceptibility testing - see [NICE Pathway: UTI in under 16s](#).
- ◆ Assess and manage children <5 years who present with fever - see [NICE Pathway: Fever in under 5s](#).
- ◆ Offer an **immediate** antibiotic prescription (see **Box 4**).
- ◆ Take account of:
 - previous urine culture and susceptibility results,
 - previous antibiotic use, which may have led to resistant bacteria.

Referral

- ◆ Refer people ≥6 years with lower UTI to hospital if they have any symptoms or signs suggesting a more serious illness or condition (e.g. sepsis).
- ◆ Refer children or young people with lower UTI to hospital in line with [NICE Pathway: UTI in under 16s](#).

Box 4:

Choice of antibiotic

Take account of local antimicrobial resistance data and follow the tables in the NICE 3-page [visual summary](#):

- ◆ Table 1 for non-pregnant women aged ≥16 years
- ◆ Table 2 for children and young people aged <16 years
- ◆ Table 3 for pregnant women aged ≥12 years
- ◆ Table 4 for men aged ≥16 years

Review

- ◆ If a urine sample has been sent for culture and susceptibility testing and antibiotic given:
 - review choice of antibiotic when microbiological results are available, **AND**
 - in pregnant women, change the antibiotic according to results if bacteria are resistant, using a narrow spectrum antibiotic wherever possible,
 - in women who are not pregnant, men and children or young people <16 years, change antibiotic according to results if bacteria are resistant and symptoms are not improving, using a narrow spectrum antibiotic wherever possible.

Advice when an antibiotic prescription is given

- ◆ When an **immediate** or **back-up** antibiotic prescription is given give advice about:
 - self-care (see **Box 3**),
 - possible adverse effects of the antibiotic, particularly diarrhoea and nausea,
 - seeking medical help if symptoms worsen rapidly or significantly at any time, do not start to improve within 48 hours of taking the antibiotic, or the person becomes systemically very unwell.
- ◆ When a **back-up** prescription is given, also give advice about:
 - an antibiotic not being needed immediately,
 - using the prescription if symptoms do not start to improve within 48 hours or if they worsen at any time.

Reassessment

- ◆ Reassess if symptoms worsen rapidly or significantly at any time, or do not start to improve within 48 hours of taking the antibiotic, taking account of:
 - other possible diagnoses,
 - any symptoms or signs suggesting a more serious illness or condition (e.g. pyelonephritis),
 - previous antibiotic use, which may have led to resistant bacteria.
- ◆ Send a urine sample for culture and susceptibility testing if this has not already been done and review treatment when results are available.

Managing asymptomatic bacteriuria

- ◆ Be aware that asymptomatic bacteriuria is:
 - significant levels of bacteria (>10⁵ colony forming units/ml) in the urine with no symptoms of UTI,
 - not routinely screened for, or treated, in women who are not pregnant, men, young people and children,
 - routinely screened for, and treated with antibiotics (see **Box 4**), in pregnant women because it is a risk factor for pyelonephritis and premature delivery.
- ◆ Offer an immediate antibiotic prescription to pregnant women with asymptomatic bacteriuria, taking account of:
 - recent urine culture and susceptibility results,
 - previous antibiotic use, which may have led to resistant bacteria.

Please go to www.nice.org.uk to check for any recent updates to this guidance.

3. Recurrent urinary tract infection: antimicrobial prescribing

NICE NG112; 2018

This guideline sets out an antimicrobial prescribing strategy for preventing recurrent urinary tract infections (UTIs) in children, young people and adults who do not have a catheter. It aims to optimise antibiotic use and reduce antibiotic resistance.

See the NICE [visual summary](#)

Preventing recurrent UTIs

- ◆ Manage an acute UTI as outlined in NICE guidance on lower UTI or pyelonephritis (see earlier in this edition of NICE Bites).
- ◆ Be aware that recurrent UTI:
 - includes lower UTI and upper UTI (acute pyelonephritis),
 - may be due to relapse (with the same strain or organism) or reinfection (with a different strain or species of organism),
 - is particularly common in women.
- ◆ Give advice to people with recurrent UTI about behavioural and personal hygiene measures and self-care treatments that may help to reduce the risk of UTI (see [Box 5](#)).

Referral and seeking specialist advice

- ◆ Refer or seek specialist advice on further investigation and management for:
 - men aged ≥16 years,
 - people with recurrent upper UTI,
 - people with recurrent lower UTI when underlying cause is unknown,
 - pregnant women,
 - children and young people <16 years in line with [NICE Pathway: UTI in under 16s](#),
 - people with suspected cancer in line with [NICE Pathway: Suspected cancer: recognition and referral](#).

Treatment and management

Oestrogen

- ◆ Consider the lowest effective dose of **vaginal oestrogen^U** (e.g. estriol cream) for **postmenopausal women** with recurrent UTI if behavioural and personal hygiene measures alone are not effective or not appropriate. Discuss the following with the woman to ensure shared decision-making:
 - severity and frequency of previous symptoms,
 - risk of developing complications from recurrent UTIs,
 - possible benefits of treatment, including for other related symptoms, such as vaginal dryness,
 - possible adverse effects such as breast tenderness and vaginal bleeding (which should be reported because it may require investigation),
 - uncertainty of endometrial safety with long-term or repeated use,
 - preferences of the woman for treatment with vaginal oestrogen.
- ◆ Review treatment within 12 months, or earlier if agreed with the woman.
- ◆ **DO NOT** offer **oral** oestrogens (hormone replacement therapy) specifically to reduce the risk of recurrent UTI in postmenopausal women.

Box 5:

Self-care

- ◆ Be aware that some non-pregnant women may wish to try D-mannose or cranberry products.
- ◆ Be aware that some children and young people <16 years may wish to try cranberry products with the advice of a paediatric specialist.
- ◆ Advise people about the sugar content of these products, which should be considered as part of the person's daily sugar intake.
- ◆ Be aware that evidence is inconclusive about whether probiotics (lactobacillus) reduce risk of UTI in people with recurrent UTI.
- ◆ Evidence of benefit for cranberry products is uncertain.

Antibiotic prophylaxis

- ◆ Before considering antibiotic prophylaxis, ensure any current UTI has been adequately treated.

Women who are not pregnant

- ◆ Consider a trial of antibiotic prophylaxis only if behavioural and personal hygiene measures, and vaginal oestrogen (in postmenopausal women) are not effective or not appropriate.
- ◆ Consider **single-dose** antibiotic prophylaxis for use when exposed to an identifiable trigger (see [Box 6](#)).
- ◆ Give advice (see [Box 7](#)).
- ◆ If there is no improvement after **single-dose** antibiotic prophylaxis or no identifiable triggers, consider a trial of **daily** antibiotic prophylaxis (see [Box 6](#)).
- ◆ Give advice (see [Box 7](#)).

Men >16 years and pregnant women ≥12 years

- ◆ Consider a trial of **daily** antibiotic prophylaxis (see [Box 6](#)) if behavioural and personal hygiene measures alone are not effective or not appropriate, with specialist advice.
- ◆ Give advice (see [Box 7](#)).

Children and young people <16 years

- ◆ Consider a trial of **daily** antibiotic prophylaxis (see [Box 6](#)) if behavioural and personal hygiene measures are not effective or not appropriate, with specialist advice.
- ◆ Give advice (see [Box 7](#)).

Box 6:

Choice of antibiotic

- ◆ Take account of local antimicrobial resistance data and follow the tables in the NICE 2-page [visual summary](#):
 - Table 1 for people aged ≥16 years
 - Table 2 for children and young people aged <16 years
- ◆ When considering **single-dose** OR **daily** antibiotic prophylaxis, take account of:
 - severity and frequency of previous symptoms,
 - risk of developing complications,
 - previous urine culture and susceptibility results,
 - previous antibiotic use, which may have led to resistant bacteria,
 - the person's preferences for antibiotic use.
- ◆ When considering **daily** prophylaxis in adults ≥16 years, also take account of:
 - any further investigations (e.g. ultrasound) that may be needed to identify an underlying cause,
 - risks of long-term antibiotic use.
- ◆ When considering **daily** prophylaxis in children and young people <16 years, also take account of:
 - underlying causes following specialist assessment and investigations,
 - the uncertain evidence of benefit of antibiotic prophylaxis for reducing risk of recurrent UTI and the rate of deterioration of renal scars.

Reassessment

- ◆ Review antibiotic prophylaxis for recurrent UTI at least every 6 months, with the review to include:
 - assessing the success of prophylaxis,
 - discussion of continuing, stopping, or changing prophylaxis,
 - a reminder about behavioural and personal hygiene measures, and self-care (see [Box 5](#)),
- ◆ If antibiotic prophylaxis is stopped, ensure that people have rapid access to treatment if they have an acute UTI.

U - unlicensed indication. Obtain and document informed consent.

3. Recurrent urinary tract infection: antimicrobial prescribing

NICE NG112; 2018

Box 7:

Advice

- ◆ When **single-dose** antibiotic prophylaxis is given, advise:
 - how to use the antibiotic (when exposed to an identifiable trigger),
 - possible adverse effects of antibiotics, particularly diarrhoea and nausea,
 - returning for review within 6 months,
 - seeking medical help if there are symptoms of an acute UTI.
- ◆ When a trial of **daily** antibiotic prophylaxis is given, advise:
 - risk of resistance with long-term antibiotics, which means they may be less effective in the future,
 - possible adverse effects of long-term antibiotics,
 - returning for review within 6 months,
 - seeking medical help if there are symptoms of an acute UTI.

NICE has also produced a guideline on [antimicrobial stewardship: systems and processes for effective antimicrobial medicine use](#).

Please go to www.nice.org.uk to check for any recent updates to this guidance.

4. Catheter-associated UTI: antimicrobial prescribing

NICE NG113; 2018

This guideline sets out an antimicrobial prescribing strategy for catheter-associated urinary tract infection (UTI) in children, young people and adults. It aims to optimise antibiotic use and reduce antibiotic resistance.

See the NICE [visual summary](#)

Treatment and management

- ◆ Be aware that:
 - a catheter-associated UTI is a symptomatic infection of the bladder or kidneys in a person with a urinary catheter,
 - the longer the catheter is in place, the more likely bacteria will be found in the urine; after one month nearly all people have bacteriuria,
 - antibiotic treatment is not routinely needed for asymptomatic bacteriuria in people with a catheter.
- ◆ Give advice about managing symptoms with self-care (see [Box 8](#)).

Choice of antibiotic

- ◆ Consider removing or, if not possible, changing the catheter if it has been in place for >7 days. Do not allow catheter removal or change to delay antibiotic treatment.
- ◆ Obtain a urine sample from the catheter, via a sampling port if provided, using aseptic technique in line with [NICE Guideline: healthcare-associated infections](#), before antibiotics are taken. If the catheter has been removed, obtain a midstream urine sample. If the catheter has been changed, obtain the sample from the new catheter.
- ◆ Send the urine sample for culture and susceptibility testing, noting suspected catheter-related infection and any antibiotic prescribed.
- ◆ Offer an antibiotic (see [Box 9](#) for choice of antibiotic).
- ◆ Take account of:
 - the severity of symptoms,
 - the risk of developing complications, which is higher in people with known or suspected structural or functional abnormality of the genitourinary tract or immunosuppression,
 - previous urine culture and susceptibility results,
 - previous antibiotic use, which may have led to resistant bacteria.
- ◆ When urine culture and susceptibility results are available:
 - review the choice of antibiotic, **AND**
 - change the antibiotic according to susceptibility results if the bacteria are resistant, using a narrow spectrum antibiotic wherever possible.

Please go to www.nice.org.uk to check for any recent updates to this guidance.

Box 8:

Self-care

- ◆ Advise people about using paracetamol for pain.
- ◆ Advise people about drinking enough fluids to avoid dehydration.

Advice when an antibiotic prescription is given

- ◆ When an antibiotic is given, give general advice on self-care (see [Box 9](#)), and about:
 - possible adverse effects of antibiotics, particularly diarrhoea and nausea,
 - seeking medical help if symptoms worsen at any time, do not start to improve within 48 hours of taking the antibiotic, or the person becomes systemically very unwell.

Reassessment

- ◆ Reassess if symptoms worsen at any time, or do not start to improve within 48 hours of taking the antibiotic, taking account of:
 - other possible diagnoses,
 - any symptoms or signs suggesting a more serious illness or condition (e.g. sepsis),
 - previous antibiotic use, which may have led to resistant bacteria.

Referral and seeking specialist advice

- ◆ Refer people to hospital if they have any symptoms or signs suggesting a more serious illness or condition (e.g. sepsis).
- ◆ Consider referring or seeking specialist advice for people who:
 - are significantly dehydrated or unable to take oral fluids and medicines, **OR**
 - are pregnant, **OR**
 - have 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]), **OR**
 - have recurrent catheter-associated UTIs, **OR**
 - have bacteria that are resistant to oral antibiotics.

Box 9:

Choice of antibiotic

- ◆ Take account of local antimicrobial resistance data and follow the tables in the NICE 3-page [visual summary](#):
 - Table 1 for non-pregnant women and men aged ≥16 years
 - Table 2 for pregnant women aged ≥12 years
 - Table 3 for children and young people aged <16 years