

Prostatitis – antimicrobial prescribing overview

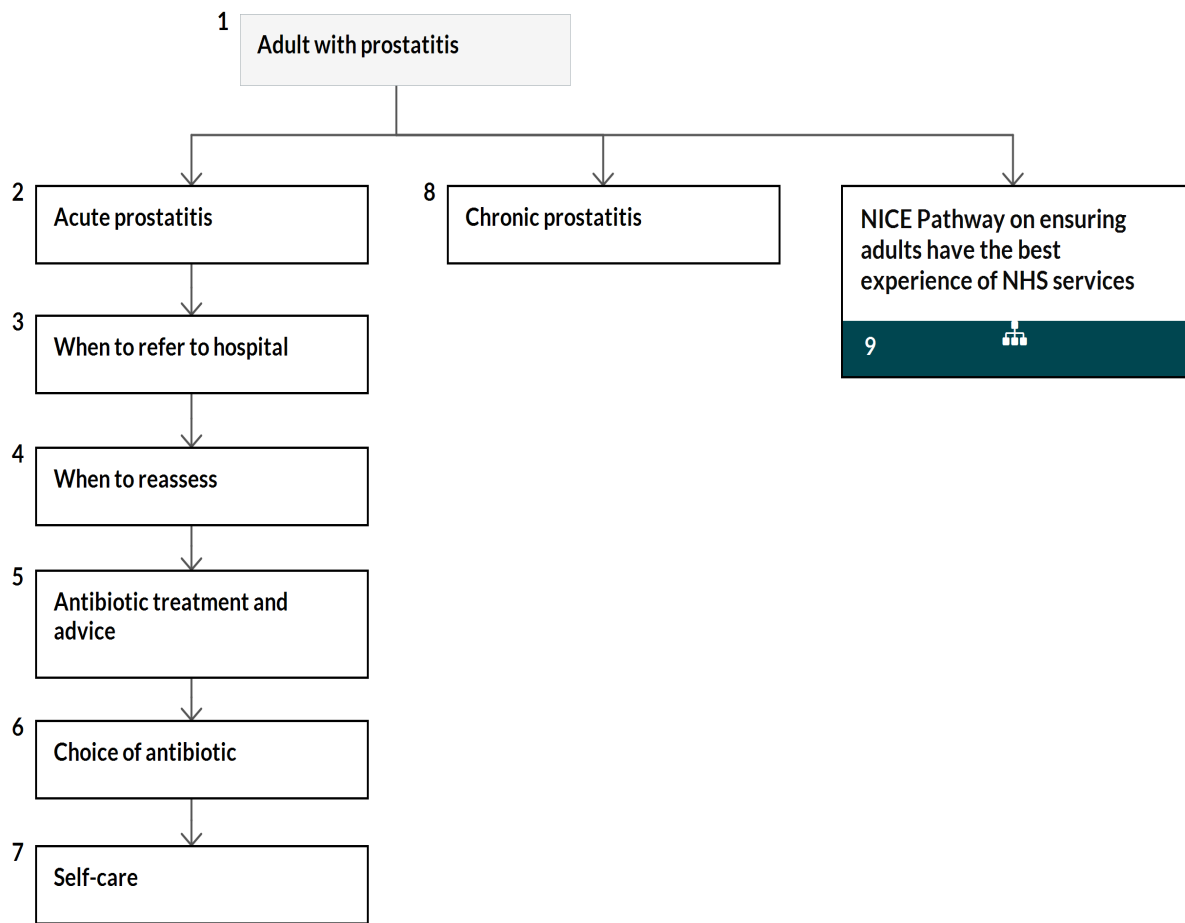
NICE Pathways bring together everything NICE says on a topic in an interactive flowchart. NICE Pathways are interactive and designed to be used online.

They are updated regularly as new NICE guidance is published. To view the latest version of this NICE Pathway see:

<http://pathways.nice.org.uk/pathways/prostatitis-antimicrobial-prescribing>

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This document contains a single flowchart and uses numbering to link the boxes to the associated recommendations.



1 Adult with prostatitis

No additional information

2 Acute prostatitis

Be aware that acute prostatitis:

- is a bacterial infection of the prostate needing treatment with antibiotics
- is usually caused by bacteria entering the prostate from the urinary tract
- can occur spontaneously or after medical procedures such as prostate biopsy
- can last several weeks
- can cause complications such as acute urinary retention and prostatic abscess.

NICE has produced a visual summary on [antimicrobial prescribing for acute prostatitis](#).

NICE has published a clinical knowledge summary on [prostatitis - acute](#). This practical resource is for primary care professionals (it is not formal NICE guidance).

Rationale

See [why we made the recommendations on antibiotics \[See page 9\]](#).

3 When to refer to hospital

Refer people with acute prostatitis to hospital if:

- they have any symptoms or signs suggesting a more serious illness or condition (for example sepsis, acute urinary retention or prostatic abscess), **or**
- their symptoms are not improving 48 hours after starting the antibiotic.

NICE has produced a visual summary on [antimicrobial prescribing for acute prostatitis](#).

See what NICE says on [sepsis](#) and [managing acute urinary retention](#).

Rationale

See [why we made the recommendations on antibiotics \[See page 9\]](#).

4 When to reassess

Reassess if symptoms worsen at any time, taking account of:

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

NICE has produced a visual summary on [antimicrobial prescribing for acute prostatitis](#).

Rationale

See [why we made the recommendations on antibiotics \[See page 9\]](#).

5 Antibiotic treatment and advice

Antibiotic treatment

Offer an antibiotic (see the recommendations on [choice of antibiotic \[See page 5\]](#)) to people with acute prostatitis. Take account of:

- the severity of symptoms
- the risk of developing complications or having treatment failure, particularly after medical procedures such as prostate biopsy
- previous urine culture and susceptibility results
- previous antibiotic use, which may have led to resistant bacteria.

Obtain a midstream urine sample before antibiotics are taken and send for culture and susceptibility testing.

When results of urine cultures 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.

NICE has produced a visual summary on [antimicrobial prescribing for acute prostatitis](#).

Advice when an antibiotic prescription is given

When an antibiotic is given, give advice about:

- the usual course of acute prostatitis (several weeks)
- possible adverse effects of the antibiotic, particularly diarrhoea and nausea
- 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.

Rationale

See [why we made the recommendations on antibiotics](#) [See page 9].

6 Choice of antibiotic

When prescribing an antibiotic for acute prostatitis, take account of [local antimicrobial resistance data](#) and follow the table below for adults aged 18 years and over.

Antibiotic ¹	Dosage and course length
First-choice oral antibiotics (guided by susceptibilities when available)²	
Ciprofloxacin (consider safety issues ³)	500 mg twice a day for 14 days then review ⁴
Ofloxacin (consider safety issues ³)	200 mg twice a day for 14 days then review ⁴
Alternative first-choice oral antibiotic if a fluoroquinolone antibiotic is not appropriate (seek specialist advice; guided by susceptibilities when available)²	

Trimethoprim	200 mg twice a day for 14 days then review ⁴
Second-choice oral antibiotics (after discussion with specialist)	
Levofloxacin (consider safety issues ³)	500 mg once a day for 14 days then review ⁴
Co-trimoxazole ⁵	960 mg twice day for 14 days then review ⁴
First-choice intravenous antibiotics (if unable to take oral antibiotics or severely unwell; guided by susceptibilities when available). Antibiotics may be combined if sepsis a concern^{2,6}	
Ciprofloxacin (consider safety issues ³)	400 mg twice or three times a day
Levofloxacin (consider safety issues ³)	500 mg once a day
Cefuroxime	1.5 g three or four times a day
Ceftriaxone	2 g once a day
Gentamicin	Initially 5 to 7 mg/kg once a day, subsequent doses adjusted according to serum gentamicin concentration ⁷

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) ⁷
Second-choice intravenous antibiotics	
Consult local microbiologist	
<p>¹ See BNF for appropriate use and dosing in specific populations, for example, hepatic impairment and renal impairment, and administering intravenous antibiotics.</p> <p>² Check any previous urine culture and susceptibility results and antibiotic prescribing and choose antibiotics accordingly.</p> <p>³ See MHRA advice for restrictions and precautions for using fluoroquinolone antibiotics due to very rare reports of disabling and potentially long-lasting or irreversible side effects affecting musculoskeletal and nervous systems. Warnings include: stopping treatment at first signs of serious adverse reaction (such as tendonitis), prescribing with special caution in people over 60 years and avoiding coadministration with a corticosteroid (March 2019).</p> <p>⁴ Review treatment after 14 days and either stop the antibiotic or continue for a further 14 days if needed based on clinical assessment.</p> <p>⁵ Co-trimoxazole should only be considered when there is bacteriological evidence of sensitivity and good reasons to prefer this combination to a single antibiotic (BNF, August 2018).</p> <p>⁶ Review intravenous antibiotics by 48 hours and consider stepping down to oral antibiotics where possible for a total of 14 days then review.</p> <p>⁷ Therapeutic drug monitoring and assessment of renal function is required (BNF, August 2018).</p>	

Give oral antibiotics first line if the person 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.

Review antibiotic treatment after 14 days and either stop the antibiotic or continue for a further 14 days if needed, based on an assessment of the person's history, symptoms, clinical examination, urine and blood tests.

NICE has produced a visual summary on [antimicrobial prescribing for acute prostatitis](#).

See what NICE says on [antimicrobial stewardship](#) and [medicines optimisation](#).

Rationale

See [why we made the recommendations on choice of antibiotic \[See page 9\]](#) and [why we made the recommendations on antibiotic course length \[See page 11\]](#).

7 Self-care

Advise people with acute prostatitis about using paracetamol (with or without a low-dose weak opioid, such as codeine) for pain, or ibuprofen if this is preferred and suitable.

Advise people with acute prostatitis about drinking enough fluids to avoid dehydration.

NICE has produced a visual summary on [antimicrobial prescribing for acute prostatitis](#).

Rationale

See [why we made the recommendations on self-care \[See page 9\]](#).

8 Chronic prostatitis

NICE has published a clinical knowledge summary on [prostatitis - chronic](#). This practical resource is for primary care professionals (it is not formal NICE guidance).

9 NICE Pathway on ensuring adults have the best experience of NHS services

[See Patient experience in adult NHS services](#)

Rationale: self-care

- Based on experience, the committee agreed that it was reasonable to advise adults with acute prostatitis about paracetamol (with or without a low-dose weak opioid, such as codeine) for self-care management of pain. These medicines have a well-established efficacy and safety profile for managing pain.
- If preferred and suitable, ibuprofen could be considered. However, the safety profile of NSAIDs and drug interactions (potential increased risk of seizures with fluoroquinolones) should be taken into account when selecting pain relief.
- Based on experience that dehydration is often cited as a cause of urinary tract infections, the committee agreed that people should be advised about drinking enough fluids to avoid dehydration.

For more information see [self-care](#) in the NICE guideline on prostatitis (acute): antimicrobial prescribing.

Rationale: antibiotics

- The committee agreed that acute prostatitis is a bacterial infection needing prompt treatment with antibiotics, but no evidence was identified to support this.
- The committee was aware of several guidelines, which reflect current practice, that make recommendations based on expert consensus and overviews of the literature on pharmacokinetics and antimicrobial resistance patterns.
- Based on experience, the committee agreed that adults with acute prostatitis should be offered an antibiotic. Urine should be sent for culture to confirm susceptibility of the bacteria and inform treatment choice.
- The committee agreed that if the results of urine culture suggest the bacteria are resistant to the antibiotic given, adults with acute prostatitis should be contacted and the antibiotic should be changed. In line with good antimicrobial stewardship, narrow-spectrum antibiotics should be used wherever possible, and antibiotics switched from intravenous to oral where applicable.
- The committee agreed that if symptoms do not start to improve within 48 hours of taking an antibiotic, people should be referred to hospital because of concerns around complications, such as acute urinary retention or prostatic abscess, and treatment failure because of resistant bacteria.

For more information see [antibiotics](#) in the NICE guideline on prostatitis (acute): antimicrobial prescribing.

Rationale: choice of antibiotic

- No evidence was identified to guide the choice of antibiotics for treating acute prostatitis.

- The committee was aware of several guidelines, which reflect current practice, that make recommendations based on expert consensus and overviews of the literature on pharmacokinetics and antimicrobial resistance patterns.
- Based on experience, the committee agreed that treating acute prostatitis requires high doses of fluoroquinolones, second- or third-generation cephalosporins or broad-spectrum penicillins (possibly combined with an aminoglycoside), with intravenous or oral use based on the severity of symptoms and the ability to take oral medicines. These antibiotics reach therapeutic levels in the prostate, and are in line with current guidelines and practice.
- Nationally for England, resistance of *E. coli* (the main causative organism of acute prostatitis) in laboratory processed urine specimens to the following antibiotics is:
 - ciprofloxacin: 10.6% (varies by area from 7.8% to 13.7%)
 - trimethoprim: 30.3% (varies by area from 27.1% to 33.4%)

(Public Health England. Antimicrobial resistance quarterly surveillance: March 2018)

- The committee also discussed that prescribers should be aware of their local antimicrobial prescribing data, because resistance rates do vary by area.
- Based on experience and resistance data, the committee agreed that the choice of first- and second-line **oral antibiotics** for managing acute prostatitis are:
 - First-choice: **ciprofloxacin** or **ofloxacin** (fluoroquinolones), or **trimethoprim** (for adults unable to take a fluoroquinolone). Fluoroquinolones are more effective against a wider range of urinary pathogens than trimethoprim. But for adults unable to take a fluoroquinolone, trimethoprim is recommended. Trimethoprim generally has a lower risk of resistance in men, and can reach therapeutic prostate levels.
 - Second-choice: **levofloxacin** (a fluoroquinolone) or **co-trimoxazole**
- The committee agreed that second-choice oral antibiotics should be reserved for use after discussion with a specialist. This is to preserve the use of the broader spectrum fluoroquinolone, levofloxacin, for people with a more severe infection, and because of restrictions on the use of co-trimoxazole in the UK.
- The committee was aware of the European Medicines Agency's Pharmacovigilance Risk Assessment Committee recommendation to restrict the use of fluoroquinolone antibiotics following a review of disabling and potentially long-lasting side effects mainly involving muscles, tendons and bones and the nervous system. However, they discussed that fluoroquinolone antibiotics are the mainstay of treatment in acute prostatitis, which is a severe infection. The committee was keen to point out, however, that fluoroquinolone safety concerns should be taken into account on an individual patient basis.
- The committee agreed that the choice of **intravenous antibiotics** for managing acute prostatitis in people who are severely unwell or unable to take oral antibiotics (with combined use if sepsis is a concern) are:
 - **ciprofloxacin** or **levofloxacin** (fluoroquinolones)
 - **cefuroxime** or **ceftriaxone** (second- or third-generation cephalosporins)

- – **gentamicin** or **amikacin** (aminoglycosides).
- This choice allows intravenous antibiotics to be selected based on the severity of illness and likely pathogens, antibiotic susceptibilities from culture results when available, and local resistance data.
- The committee noted that use of broad-spectrum antibiotics, such as fluoroquinolones or later-generation cephalosporins, can create a selective advantage for bacteria resistant to these second-line broad-spectrum agents, allowing such strains to proliferate and spread. And, by disrupting normal flora, broad-spectrum antibiotics can leave people susceptible to harmful bacteria such as *Clostridium difficile* in community settings. However, these antibiotics are appropriate for the empirical treatment of acute prostatitis, where coverage of more resistant strains of common bacterial pathogens is required.

For more information see [choice of antibiotic](#) in the NICE guideline on prostatitis (acute): antimicrobial prescribing.

Rationale: antibiotic course length

- No evidence was identified to guide antibiotic course length for treating acute prostatitis. The committee was aware of several guidelines that make recommendations based on expert consensus and overviews of the literature on pharmacokinetics and antimicrobial resistance patterns.
- Based on experience, the committee agreed that treating acute prostatitis requires oral antibiotics for between 2 and 4 weeks, with initial intravenous antibiotics if adults are unable to take oral antibiotics or are severely unwell. This is in line with current guidelines and practice.
- However, in line with good antimicrobial stewardship, the shortest course that is likely to be effective should be prescribed to reduce the risk of antimicrobial resistance and minimise the risk of adverse effects. First-line antibiotics for acute prostatitis are fluoroquinolones, which are broad-spectrum antibiotics. These antibiotics, in particular, should be used for the shortest effective time because they can create a selective advantage for bacteria resistant to these 'last-line' broad-spectrum agents, and can leave people susceptible to *Clostridium difficile*.
- Use of intravenous antibiotics should be reviewed by 48 hours (taking into account the person's response to treatment and susceptibility results from urine culture) and switched to oral treatment where possible.
- The committee agreed that a minimum of a 14-day course of all the recommended antibiotics was required for acute prostatitis. At 14 days, treatment should be reviewed, and either stopped or continued for a further 14 days as needed based on clinical assessment. From experience, the committee discussed that whether to continue treatment or not would be based on the person's history or risk of developing chronic prostatitis, their current symptoms and any recent examination, urine and blood test results. Continued symptoms, such as fever or lower urinary tract symptoms (dysuria, frequency, urgency, or acute urinary retention) require ongoing treatment.

For more information see [antibiotic course length](#) in the NICE guideline on prostatitis (acute): antimicrobial prescribing.

Sources

[Prostatitis \(acute\): antimicrobial prescribing](#) (2018) NICE guideline NG110

Your responsibility

Guidelines

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should [assess and reduce the environmental impact of implementing NICE recommendations](#) wherever possible.

Technology appraisals

The recommendations in this interactive flowchart represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, health professionals are expected to take these recommendations fully into account, alongside the

individual needs, preferences and values of their patients. The application of the recommendations in this interactive flowchart is at the discretion of health professionals and their individual patients and do not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian.

Commissioners and/or providers have a responsibility to provide the funding required to enable the recommendations to be applied when individual health professionals and their patients wish to use it, in accordance with the NHS Constitution. They should do so in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Medical technologies guidance, diagnostics guidance and interventional procedures guidance

The recommendations in this interactive flowchart represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, healthcare professionals are expected to take these recommendations fully into account. However, the interactive flowchart does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

Commissioners and/or providers have a responsibility to implement the recommendations, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity, and foster good relations. Nothing in this interactive flowchart should be interpreted in a way that would be inconsistent with compliance with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.