

Urinary tract infection (lower) - men - Management

Scenario: Lower urinary tract infection in men

How should I manage lower urinary tract infection in a man without an indwelling urinary catheter?

- Follow local guidelines, when these are available.
- If symptoms are severe (for example severe nausea and vomiting, confusion, tachypnoea, tachycardia, or hypotension), admit the person to hospital; intravenous antibiotics may be required.
- If there is fever or loin pain (or both), manage as upper urinary tract infection (UTI) — see the CKS topic on [Pyelonephritis - acute](#).
- Otherwise, treat for lower UTI:
 - Obtain a urine sample for culture and microscopy before starting antibiotic treatment.
 - Relieve symptoms with paracetamol or ibuprofen.
 - Start empirical treatment with trimethoprim or nitrofurantoin:
 - Trimethoprim 200 mg twice daily, for 7 days. Trimethoprim should not be used for empirical treatment if the man has a history of recurrent infections or has taken trimethoprim within the past 12 months.
 - Nitrofurantoin 50 mg four times daily, or 100 mg (modified-release) twice daily, for 7 days. The standard formulation is suitable for most people. Consider prescribing the modified-release formulation if nausea has previously been troublesome with the standard formulation, or if adherence with taking medication four times daily is likely to be poor.
 - [Follow up](#) after 48 hours (or according to the clinical situation) to check response to treatment and the urine culture results.

[In depth](#)

How should I follow up a man with lower urinary tract infection?

- Review after 48 hours (or according to the clinical situation) to check response to treatment and the culture results.
- If urine culture shows that the organism is resistant to the current antibiotic, change to an antibiotic that the organism is sensitive to.

- If symptoms have resolved by the time the culture result is available, consider continuing with the current antibiotic, and doing a 'test of cure' urine culture after completing treatment. If symptoms then recur, treat with an antibiotic shown to cover the infecting organism.
- Consider if there are any [risk factors](#) that need to be excluded or managed.
- Consider [referral](#) for specialist urological assessment when the man has recovered from the acute infection.

[In depth](#)

[When should I refer a man with lower urinary tract infection?](#)

- **Admit** the man to hospital if symptoms are severe (for example severe nausea and vomiting, confusion, tachypnoea, tachycardia, or hypotension) — intravenous antibiotics may be required.
- **Referral for urological assessment is not routinely required** for men who have had a urinary tract infection (UTI).
- **Refer for urological assessment men who:**
 - Have failed to respond to appropriate antibiotic treatment.
 - May have an underlying cause for the UTI (such as urinary obstruction, which is more likely in older men, especially if they have hesitancy, straining, or weak urinary stream).
 - Have frequent episodes of UTI (for example two or more episodes in a 3-month period).
 - Have a history of pyelonephritis, calculi, or previous genitourinary tract surgery.
 - Are younger than 50 years of age and have persistent microscopic haematuria with otherwise normal renal function tests (urinary protein and serum creatinine).
- **Refer for renal assessment** if the man has persistent microscopic haematuria with proteinuria or raised serum creatinine.
- **Refer urgently if cancer is suspected.** Refer the man to a team specializing in the management of urological cancer if:
 - He is of any age, with macroscopic haematuria and urine culture fails to confirm a UTI or the haematuria does not resolve with treatment of the UTI.
 - He is 40 years of age or older, and presents with recurrent or persistent UTI associated with haematuria.

- He is 50 years of age or older, and is found to have unexplained microscopic haematuria.
- An abdominal mass is identified (clinically or on imaging) that is thought to arise from the urinary tract.

[In depth](#)

How should I manage recurrent urinary tract infection?

- Culture the urine (whatever the results of urine dipstick tests).
- [Treat](#) each episode as for acute lower urinary tract infection (UTI).
- If the man is sexually active, rule out chlamydial infection — see the CKS topic on [Urethritis - male](#).
- [Refer](#) for urological assessment if there are two or more episodes of UTI in 3 months.

[In depth](#)

Prescriptions

Trimethoprim or nitrofurantoin for 7 days

Age from 14 years onwards

Nitrofurantoin capsules: 50mg four times a day for 7 days

Nitrofurantoin 50mg capsules
 Take one capsule four times a day for 7 days.
 Supply 28 capsules.

Age: from 14 years onwards
NHS cost: £2.32
Licensed use: yes

Patient information: This medicine may cause your urine to turn more yellow than normal.

Age from 16 years onwards

Nitrofurantoin tablets: 50mg four times a day for 7 days

Nitrofurantoin 50mg tablets
 Take one tablet four times a day for 7 days.
 Supply 28 tablets.

Age: from 16 years onwards
NHS cost: £2.83
Licensed use: yes

Patient information: This medicine may cause your urine to turn more yellow than normal.

Nitrofurantoin m/r caps: 100mg twice a day for 7 days

Nitrofurantoin 100mg modified-release capsules
 Take one capsule twice a day for 7 days.
 Supply 14 capsules.

Age: from 16 years onwards

NHS cost: £4.89
Licensed use: yes

Patient information: This medicine may cause your urine to turn more yellow than normal.

Trimethoprim tablets: 200mg twice a day for 7 days

Trimethoprim 200mg tablets
Take one tablet twice a day for 7 days.
Supply 14 tablets.

Age: from 16 years onwards
NHS cost: £0.91
Licensed use: yes

Analgesia: use when required

Age from 16 years onwards

Ibuprofen tablets: 200mg to 400mg three to four times a day

Ibuprofen 200mg tablets
Take one or two tablets 3 to 4 times a day when required for pain relief. Do not exceed the stated dose.
Supply 56 tablets.

Age: from 16 years onwards
NHS cost: £1.38
OTC cost: £2.38
Licensed use: yes

Paracetamol tablets: 500mg to 1g up to four times a day

Paracetamol 500mg tablets
Take one or two tablets every 4 to 6 hours when required for pain relief. Maximum of 8 tablets in 24 hours.
Supply 50 tablets.

Age: from 16 years onwards
NHS cost: £0.78
OTC cost: £1.35
Licensed use: yes

Urinary tract infection (lower) - men - Management

Scenario: Urinary tract infection in men with an indwelling catheter

How should I manage lower urinary tract infection in a man with an indwelling catheter?

- Follow local guidelines, when these are available.
- Do not treat asymptomatic bacteriuria.

- Considerable clinical judgement is required to [diagnose](#) urinary tract infection (UTI) in men with an indwelling urinary catheter.
- If symptoms are severe (for example severe nausea and vomiting, confusion, tachypnoea, tachycardia, hypotension, reduced urine output), admit the person to hospital; intravenous antibiotics may be required.
- Check that the catheter is correctly positioned and is not blocked. If the catheter has been in place for more than a week, consider changing it before starting antibiotic treatment.
- If there is fever or loin pain (or both), manage as upper UTI. See the CKS topic on [Pyelonephritis - acute](#).
- Otherwise, treat for lower UTI:
 - Relieve symptoms with paracetamol or ibuprofen.
 - Before starting antibiotic treatment, obtain a urine sample for culture and microscopy.
 - Treat with an antibiotic for 7 days.
 - If symptoms are mild, consider withholding antibiotics until the result of urine culture is available to guide choice of antibiotic.
 - If treatment cannot wait for the culture results, start empirical treatment with trimethoprim or nitrofurantoin.
 - Trimethoprim 200 mg twice daily, for 7 days. Trimethoprim should not be used for empirical treatment if the man has a history of recurrent infections or has taken trimethoprim within the past 12 months.
 - Nitrofurantoin 50 mg four times daily, or 100 mg (modified-release) twice daily, for 7 days. The standard formulation is suitable for most people. Consider prescribing the modified-release formulation if nausea has previously been troublesome with the standard formulation, or if adherence with taking medication four times daily is likely to be poor.
 - [Follow up](#) after 48 hours (or according to the clinical situation) to check response to treatment and the urine culture results.

[In depth](#)

How can I prevent urinary tract infections in men with indwelling catheters?

- **Ensure an indwelling urinary catheter is appropriate.**
 - Use an indwelling catheter only after alternative methods of management have been considered.
 - Regularly review the clinical need for catheterization and remove the catheter as soon as possible.
 - Use intermittent catheterization in preference to an indwelling catheter if this is clinically appropriate and is a practical option for the person.
- **Prevent the introduction of infection.**
 - Healthcare personnel should be trained and assessed in their competence to perform urethral catheterization using aseptic procedures.
 - Urine samples should be obtained from a sampling port using an aseptic technique.
 - Catheters should be changed only when clinically necessary (for example to prevent blockage), or according to the manufacturer's recommendations.
 - When changing catheters, antibiotic prophylaxis should only be used for people with a history of catheter-associated urinary tract infection following catheter change.
- **Do not use:**
 - Bladder instillations or washouts.
 - Prophylactic antibiotics when changing catheters in men with a heart valve lesion, septal defect, patent ductus, or prosthetic valve.
 - Topical antiseptics or antibiotics applied to the catheter, urethra, or meatus — daily washing of the meatus with soap and water is sufficient.

[In depth](#)

How should I follow up a catheterized man with lower urinary tract infection?

- Review after 48 hours, or according to the clinical situation, to ensure the man is responding to treatment, and to check the results of the urine culture.
- If urine culture shows that the organism is resistant to the current antibiotic, and:
 - If symptoms have not resolved, change to an antibiotic that the organism is sensitive to.

- If symptoms have resolved, consider continuing with the current antibiotic.
- If symptoms recur, start treatment with an antibiotic shown in the laboratory report to cover the infecting organism.
- If the man fails to respond to two courses of antibiotic shown by urine culture to be appropriate treatment, and compliance has been good, consider referring for assessment and investigation.

[In depth](#)

When should I refer a catheterized man with lower urinary tract infection?

- Consider referring for assessment and investigation if the man fails to respond to two courses of antibiotic shown by urine culture to be appropriate treatment, and treatment adherence has been verified.
- **If cancer is suspected, refer urgently.** Refer the man to a team specializing in the management of urological cancer if:
 - He is of any age, with macroscopic haematuria and urine culture fails to confirm a urinary tract infection (UTI) or the haematuria does not resolve with treatment of a UTI.
 - He is 40 years of age or older, and presents with recurrent or persistent UTI associated with haematuria.
 - He is 50 years of age or older, and has unexplained microscopic haematuria — exclude causes such as the urinary catheter and infection.
 - An abdominal mass is identified (clinically or on imaging) that is thought to arise from the urinary tract.
- **If there is persistent microscopic haematuria**, and this is not thought to be caused by a urinary catheter:
 - Refer for urological assessment those men younger than 50 years of age who do not have proteinuria or raised serum creatinine.
 - Refer for renal assessment those men with proteinuria or raised serum creatinine.

[In depth](#)

Prescriptions

Analgesia: use when required

Age from 16 years onwards

Ibuprofen tablets: 200mg to 400mg three to four times a day

Ibuprofen 200mg tablets

Take one or two tablets 3 to 4 times a day when required for pain relief. Do not exceed the stated dose.

Supply 56 tablets.

Age: from 16 years onwards

NHS cost: £1.38

OTC cost: £2.38

Licensed use: yes

Paracetamol tablets: 500mg to 1g up to four times a day

Paracetamol 500mg tablets

Take one or two tablets every 4 to 6 hours when required for pain relief. Maximum of 8 tablets in 24 hours.

Supply 50 tablets.

Age: from 16 years onwards

NHS cost: £0.78

OTC cost: £1.35

Licensed use: yes

Trimethoprim or nitrofurantoin for 7 days

Age from 14 years onwards

Nitrofurantoin capsules: 50mg four times a day for 7 days

Nitrofurantoin 50mg capsules

Take one capsule four times a day for 7 days.

Supply 28 capsules.

Age: from 14 years onwards

NHS cost: £2.32

Licensed use: yes

Patient information: This medicine may cause your urine to turn more yellow than normal.

Age from 16 years onwards

Nitrofurantoin tablets: 50mg four times a day for 7 days

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Supply 14 capsules.

Age: from 16 years onwards

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Take one tablet twice a day for 7 days.
Supply 14 tablets.

Age: from 16 years onwards

NHS cost: £0.91

Licensed use: yes

Urinary tract infection (lower) - men - Management

Detailed answers

Overview of management

Men without an indwelling urinary catheter

- If symptoms are severe, admit the man to hospital.
- Otherwise, start empirical treatment with trimethoprim or nitrofurantoin for 7 days.
 - Before starting the antibiotic, send a urine sample for culture and microscopy.
 - Local guidelines or local antibiotic resistance patterns may suggest that other antibiotics are more appropriate for empirical treatment.
- Relieve symptoms with paracetamol or ibuprofen.
- Review after 48 hours to assess response to treatment, and to check the urine culture results.
- Exclude or manage risk factors.
- Do not routinely refer for urological assessment. Refer those men who fail to respond to appropriate treatment or who experience frequent recurrence, and those with features of urinary obstruction, persistent microscopic haematuria, or history of genitourinary tract surgery, pyelonephritis, or calculi.
- Refer urgently if cancer is suspected.

Men with an indwelling urinary catheter

- Do not routinely treat asymptomatic bacteriuria. Considerable clinical judgement is required to [diagnose](#) urinary tract infection (UTI) in the presence of an indwelling urinary catheter.
- Admit the man to hospital if there are symptoms and signs of severe infection.

- Check that the catheter is correctly positioned and is not blocked. If the catheter has been in place for more than a week, consider changing it before starting antibiotic treatment.
- Relieve symptoms with paracetamol or ibuprofen.
- Treat with an antibiotic for 7 days.
 - Before starting the antibiotic, send a urine sample for culture and microscopy.
 - If symptoms are mild, consider withholding antibiotics until the urine culture results are available.
 - If treatment cannot wait for the culture results, empirically prescribe trimethoprim or nitrofurantoin.
 - Local guidelines or local antibiotic resistance patterns may suggest that other antibiotics are more appropriate for empirical treatment.
- When the culture results are available, check the choice of antibiotic, and if necessary change to an antibiotic that the organism is sensitive to.

Lower urinary tract infection in men

How should I manage lower urinary tract infection in a man without an indwelling urinary catheter?

- Follow local guidelines, when these are available.
- If symptoms are severe (for example severe nausea and vomiting, confusion, tachypnoea, tachycardia, or hypotension), admit the person to hospital; intravenous antibiotics may be required.
- If there is fever or loin pain (or both), manage as upper urinary tract infection (UTI) — see the CKS topic on [Pyelonephritis - acute](#).
- Otherwise, treat for lower UTI:
 - Obtain a urine sample for culture and microscopy before starting antibiotic treatment.
 - Relieve symptoms with paracetamol or ibuprofen.
 - Start empirical treatment with trimethoprim or nitrofurantoin.
 - Trimethoprim 200 mg twice daily, for 7 days. Trimethoprim should not be used for empirical treatment if the man has a history of recurrent infections or has taken trimethoprim within the past 12 months.

- Nitrofurantoin 50 mg four times daily, or 100 mg (modified-release) twice daily, for 7 days. The standard formulation is suitable for most people. Consider prescribing the modified-release formulation if nausea has previously been troublesome with the standard formulation, or if adherence with taking medication four times daily is likely to be poor.
- [Follow up](#) after 48 hours (or according to the clinical situation) to check response to treatment and the urine culture results.

Basis for recommendation

These recommendations are based on guidelines from the Scottish Intercollegiate Guidelines Network (SIGN), the Health Protection Agency (HPA), and the European Urological Association (EUA) [[SIGN, 2006](#); [HPA and Association of Medical Microbiologists, 2008](#); [European Association of Urology, 2009](#)]. Because urinary tract infection (UTI) in men is rare, there are no controlled trials. These guidelines are therefore based on expert opinion or extrapolation from studies in women with UTI.

Obtaining a urine sample before starting treatment

- Obtaining a urine sample for culture and sensitivity before starting treatment is recommended:
 - To confirm UTI — urine dipstick tests are not sufficiently accurate. This recommendation is pragmatic, and is extrapolated from the evidence on the use of urine dipstick tests to diagnose lower UTI in women. Recent UK national and European guidelines do not discuss the use of urine dipstick tests for men with suspected UTI [[SIGN, 2006](#); [HPA and Association of Medical Microbiologists, 2008](#); [European Association of Urology, 2009](#)]. A recent systematic review and meta-analysis of urine dipstick tests to exclude UTI found that only one of 23 studies was done in men, and reported results combined from all studies without regard to gender [[St John et al, 2006](#)].
 - To guide the choice of antibiotic — resistance to first-line antibiotics is not uncommon, and infections with multi-resistant *Escherichia coli* with extended-spectrum beta-lactamase enzymes (ESBL) are increasing [[HPA and Association of Medical Microbiologists, 2008](#)].

Empirical treatment with trimethoprim or nitrofurantoin

- There is no [evidence](#) from clinical trials of antibiotics for lower UTI in men. Therefore, recommendations are based on evidence extrapolated from treatment of lower UTI in women (which is reviewed in the CKS topic on [Urinary tract infection \(lower\) - women](#)) and on expert opinion.
- **Choice of antibiotic**

- Trimethoprim and nitrofurantoin are active against most uropathogens, and are recommended as first-line options by the Health Protection Agency (HPA) and Association of Medical Microbiologists for use in men with lower UTI and *without* fever and flank pain [[HPA, 2009](#)].
- Several guidelines recommend that nitrofurantoin should not be used to treat UTI in men. This is on the grounds that it can be difficult to exclude the possibility of prostatitis, and that nitrofurantoin is not present in therapeutic concentrations in prostatic secretions [[SIGN, 2006](#); [European Association of Urology, 2009](#)]. However, these recommendations refer to UTI with fever or other signs of acute prostatitis, and neither guideline expressed concern that acute prostatitis would be likely in men with symptoms of lower UTI and without fever and other symptoms of prostatitis.
- For initial empirical treatment, the HPA and Association of Medical Microbiologists recommend not using broad-spectrum antibiotics (such as co-amoxiclav, quinolones, and cephalosporins) when narrow-spectrum antibiotics remain effective. This is because broad-spectrum antibiotics increase the risk of *Clostridium difficile*, methicillin resistant *Staphylococcus aureus* (MRSA), and the development of antibiotic resistance [[HPA and Association of Medical Microbiologists, 2008](#)].
- Trimethoprim is not recommended if the man has used it in the past 12 months because use of trimethoprim up to 1 year previously is associated with increased risk of infection with a resistant organism. The evidence is reviewed in the CKS topic on [Urinary tract infection \(lower\) - women](#).
- Trimethoprim is not recommended for empirical treatment of recurrent UTI in men because of the (theoretical) increased risk that this is due to a resistant organism.

- **Duration of treatment**

- In contrast to the situation in women, there is no [evidence](#) that short courses are as effective as longer courses of antibiotics to treat lower UTI in men. Because men are more likely than women to have an occult complicating factor, at least 7 days of antibiotic treatment is recommended [[SIGN, 2006](#); [European Association of Urology, 2009](#)].

How should I follow up a man with lower urinary tract infection?

- Review after 48 hours (or according to the clinical situation) to check response to treatment and the culture results.
- If urine culture shows that the organism is resistant to the current antibiotic, change to an antibiotic that the organism is sensitive to.

- If symptoms have resolved by the time the culture result is available, consider continuing with the current antibiotic, and doing a 'test of cure' urine culture after completing treatment. If symptoms then recur, treat with an antibiotic shown to cover the infecting organism.
- Consider if there are any [risk factors](#) that need to be excluded or managed.
- Consider [referral](#) for specialist urological assessment when the man has recovered from the acute infection.

Basis for recommendation

- These recommendations are pragmatic, as there is no evidence from clinical trials or published expert opinion.
- Continuing the initial antibiotic is recommended when urine culture reveals a resistant uropathogen and the man's symptoms have resolved, because either the infection is resolving on its own or the organism is susceptible despite the laboratory assessment of resistance.

When should I refer a man with lower urinary tract infection?

- **Admit** the man to hospital if symptoms are severe (for example severe nausea and vomiting, confusion, tachypnoea, tachycardia, or hypotension) — intravenous antibiotics may be required.
- **Referral for urological assessment is not routinely required** for men who have had a urinary tract infection (UTI).
- **Refer for urological assessment men who:**
 - Have failed to respond to appropriate antibiotic treatment.
 - May have an underlying cause for the UTI (such as urinary obstruction, which is more likely in older men, especially if they have hesitancy, straining, or weak urinary stream).
 - Have frequent episodes of UTI (for example two or more episodes in a 3-month period).
 - Have a history of pyelonephritis, calculi, or previous genitourinary tract surgery.
 - Are younger than 50 years of age and have persistent microscopic haematuria with otherwise normal renal function tests (urinary protein and serum creatinine).
- **Refer for renal assessment** if the man has persistent microscopic haematuria with proteinuria or raised serum creatinine.

- **Refer urgently if cancer is suspected.** Refer the man to a team specializing in the management of urological cancer if:
 - He is of any age, with macroscopic haematuria and urine culture fails to confirm a UTI or the haematuria does not resolve with treatment of the UTI.
 - He is 40 years of age or older, and presents with recurrent or persistent UTI associated with haematuria.
 - He is 50 years of age or older, and is found to have unexplained microscopic haematuria.
 - An abdominal mass is identified (clinically or on imaging) that is thought to arise from the urinary tract.

Clarification / Additional information

- Urological assessment aims to identify and manage possible underlying causes, such as:
 - Prostatitis.
 - Prostatic enlargement due to cancer or benign prostatic hypertrophy.
 - Calculi.
 - Bladder cancer.

Basis for recommendation

- The referral guidelines for suspected cancer are those published by the National Institute for Health and Clinical Excellence (NICE) [[National Collaborating Centre for Primary Care, 2005](#)].
- The other recommendations are pragmatic. National and European guidelines agree that the value of urological evaluation in men who have had a single uncomplicated urinary tract infection (UTI) has not been determined sufficiently well to make recommendations on referral [[SIGN, 2006](#); [European Association of Urology, 2009](#)].
- However, the recommendations on referral do take account of weak [evidence](#) from a systematic review of urological investigations in men with lower UTI that urological abnormalities are most likely to be found in men who are more than 45 years of age, who do not respond well to antibiotics, or who have recurrent UTIs [[Fernandez, 2004](#)].

How should I manage recurrent urinary tract infection?

- Culture the urine (whatever the results of urine dipstick tests).
- [Treat](#) each episode as for acute lower urinary tract infection (UTI).
- If the man is sexually active, rule out chlamydial infection — see the CKS topic on [Urethritis - male](#).
- [Refer](#) for urological assessment if there are two or more episodes of UTI in 3 months.

Basis for recommendation

In the absence of relevant clinical trials, authoritative guidelines, and published expert opinion, these recommendations are pragmatic.

- Managing each episode as for acute lower urinary tract infection (UTI) is recommended because there is no evidence that an alternative approach would be preferable.
- Excluding chlamydial infection in sexually active men is recommended because this is fairly common, and is easy to miss unless it is specifically looked for.
- The details of the recommendations on referral are pragmatic, but are in line with national and European guidelines [[SIGN, 2006](#); [European Association of Urology, 2009](#)].
- The use of antibiotics to prevent UTIs from recurring has not been mentioned in the recommendations because:
 - It is not discussed in guidelines.
 - It has not been studied in controlled trials.
 - Men with problematic recurrent UTIs should be referred to a urologist.

Urinary tract infection in men with an indwelling catheter

How should I manage lower urinary tract infection in a man with an indwelling catheter?

- Follow local guidelines, when these are available.
- Do not treat asymptomatic bacteriuria.
- Considerable clinical judgement is required to [diagnose](#) urinary tract infection (UTI) in men with an indwelling urinary catheter.

- If symptoms are severe (for example severe nausea and vomiting, confusion, tachypnoea, tachycardia, hypotension, reduced urine output), admit the person to hospital; intravenous antibiotics may be required.
- Check that the catheter is correctly positioned and is not blocked. If the catheter has been in place for more than a week, consider changing it before starting antibiotic treatment.
- If there is fever or loin pain (or both), manage as upper UTI. See the CKS topic on [Pyelonephritis - acute](#).
- Otherwise, treat for lower UTI.
 - Relieve symptoms with paracetamol or ibuprofen.
 - Before starting antibiotic treatment, obtain a urine sample for culture and microscopy.
 - Treat with an antibiotic for 7 days.
 - If symptoms are mild, consider withholding antibiotics until the result of urine culture is available to guide choice of antibiotic.
 - If treatment cannot wait for the culture results, start empirical treatment with trimethoprim or nitrofurantoin.
 - Trimethoprim 200 mg twice daily, for 7 days. Trimethoprim should not be used for empirical treatment if the man has a history of recurrent infections or has taken trimethoprim within the past 12 months.
 - Nitrofurantoin 50 mg four times daily, or 100 mg (modified-release) twice daily, for 7 days. The standard formulation is suitable for most people. Consider prescribing the modified-release formulation if nausea has previously been troublesome with the standard formulation, or if adherence with taking medication four times daily is likely to be poor.
 - [Follow up](#) after 48 hours (or according to the clinical situation) to check response to treatment and the urine culture results.

Basis for recommendation

Using clinical judgement to decide when to use antibiotics

- Careful clinical judgement is recommended when deciding to use an antibiotic in people with an indwelling urinary catheter. This is because all people with a long-term indwelling urinary catheter will

have bacteriuria at some stage, there is no good evidence that antibiotics are beneficial for asymptomatic bacteriuria, and repeated treatment of asymptomatic bacteriuria increases the risk of colonization by drug-resistant bacteria [[SIGN, 2006](#); [European Association of Urology, 2009](#)].

Admitting to hospital

- The recommendation to admit the person to hospital if systemic symptoms and signs are present is based on expert opinion [[SIGN, 2006](#)].

Reviewing catheter care

- The recommendation to review the care of the catheter is based on expert opinion [[NICE, 2003](#); [European Association of Urology, 2009](#)].
- The recommendation to consider changing the catheter before starting antibiotic treatment for urinary tract infection (UTI) is based on one small trial and expert opinion [[SIGN, 2006](#); [European Association of Urology, 2009](#)]. See the [evidence](#) in the CKS topic on [Urinary tract infection \(lower\) - women](#).

Using urine culture to guide the choice of antibiotic

- The recommendation to use the culture results to guide treatment and, if practical, to withhold treatment until the culture results are available, is based on expert opinion. It is intended to reduce the risks of complications and treatment failure, which are generally increased in people with an indwelling urinary catheter [[SIGN, 2006](#)].
- The recommendation to change to a more appropriate antibiotic if the antibiotic was started empirically and a resistant organism is isolated on urine culture is based on expert opinion. It is intended to reduce the risks of complications and treatment failure [[SIGN, 2006](#); [European Association of Urology, 2009](#)].

Relieving symptoms

- CKS found no trials of analgesics for relieving the symptoms of UTI. The recommendation to use paracetamol or ibuprofen to treat the symptoms of UTI is based on their use in other painful infections and the experience of experts [[SIGN, 2006](#)].

Choosing an antibiotic

- As there is no direct evidence from clinical trials of different antibiotics in men with an indwelling urinary catheter, the recommendation to prescribe trimethoprim or nitrofurantoin for empirical treatment of UTI is based on the recommendations in the [Treatment](#) section of *Managing lower UTI in men*.

Treating for 7 days

- Antibiotic treatment for 7 days is recommended because there is only one small trial of treatment duration. Although this found that shorter courses are equally effective for UTI in people with an indwelling urinary catheter, further studies are required to support a recommendation for a shorter course. See the [evidence](#) in the CKS topic on [Urinary tract infection \(lower\) - women](#).

How should I follow up a catheterized man with lower urinary tract infection?

- Review after 48 hours, or according to the clinical situation, to ensure the man is responding to treatment, and to check the results of the urine culture.
- If urine culture shows that the organism is resistant to the current antibiotic, and:
 - If symptoms have not resolved, change to an antibiotic that the organism is sensitive to.
 - If symptoms have resolved, consider continuing with the current antibiotic.
 - If symptoms recur, start treatment with an antibiotic shown in the laboratory report to cover the infecting organism.
- If the man fails to respond to two courses of antibiotic shown by urine culture to be appropriate treatment, and compliance has been good, consider referring for assessment and investigation.

Basis for recommendation

These recommendations are pragmatic. CKS found no published expert opinion.

- **When the uropathogen is resistant to the empirically chosen antibiotic and the man has responded:**
 - The recommendation to consider continuing treatment until the end of the antibiotic course is based on the comments of CKS expert reviewers. If symptoms have resolved, there is likely to be little added benefit from changing the antibiotic. This is because either the infection is resolving on its own, or the laboratory assessment of resistance does not reflect the true susceptibility of the uropathogen.

When should I refer a catheterized man with lower urinary tract infection?

- Consider referring for assessment and investigation if the man fails to respond to two courses of antibiotic shown by urine culture to be appropriate treatment, and treatment adherence has been verified.
- **If cancer is suspected, refer urgently.** Refer the man to a team specializing in the management of urological cancer if:
 - He is of any age, with macroscopic haematuria and urine culture fails to confirm a urinary tract infection (UTI) or the haematuria does not resolve with treatment of a UTI.
 - He is 40 years of age or older, and presents with recurrent or persistent UTI associated with haematuria.
 - He is 50 years of age or older, and has unexplained microscopic haematuria — exclude causes such as the urinary catheter and infection.
 - An abdominal mass is identified (clinically or on imaging) that is thought to arise from the urinary tract.
- **If there is persistent microscopic haematuria**, and this is not thought to be caused by a urinary catheter:
 - Refer for urological assessment those men younger than 50 years of age who do not have proteinuria or raised serum creatinine.
 - Refer for renal assessment those men with proteinuria or raised serum creatinine.

Basis for recommendation

Referral for failure to respond to appropriate antibiotics

- The recommendation to consider referring men who have failed to respond to an appropriate antibiotic (shown by urine culture) is pragmatic, as CKS found no direct evidence from clinical trials or recommendations in national guidelines.

Urgent referral for urological cancer

- The recommendation to refer men with suspected urological cancer is based on criteria in guidelines from the National Institute for Health and Clinical Excellence (NICE) [[National Collaborating Centre for Primary Care, 2005](#)].

How can I prevent urinary tract infections in men with indwelling catheters?

- **Ensure an indwelling urinary catheter is appropriate.**
 - Use an indwelling catheter only after alternative methods of management have been considered.
 - Regularly review the clinical need for catheterization and remove the catheter as soon as possible.
 - Use intermittent catheterization in preference to an indwelling catheter if this is clinically appropriate and is a practical option for the person.
- **Prevent the introduction of infection.**
 - Healthcare personnel should be trained and assessed in their competence to perform urethral catheterization using aseptic procedures.
 - Urine samples should be obtained from a sampling port using an aseptic technique.
 - Catheters should be changed only when clinically necessary (for example to prevent blockage), or according to the manufacturer's recommendations.
 - When changing catheters, antibiotic prophylaxis should only be used for people with a history of catheter-associated urinary tract infection following catheter change.
- **Do not use:**
 - Bladder instillations or washouts.
 - Prophylactic antibiotics when changing catheters in men with a heart valve lesion, septal defect, patent ductus, or prosthetic valve.
 - Topical antiseptics or antibiotics applied to the catheter, urethra, or meatus — daily washing of the meatus with soap and water is sufficient.

Basis for recommendation

These recommendations are based on guidelines from the National Institute for Health and Clinical Excellence (NICE) [[NICE, 2003](#)].

Minimizing the use of indwelling urinary catheters

- The recommendations on training and practical ways to minimize the use of indwelling urinary catheters reflect guidelines from NICE [[NICE, 2003](#)].
- NICE based their recommendation to use intermittent catheterization rather than an indwelling urinary catheter on a systematic review which included 22 studies, and 10 further studies.

Not using bladder instillations or washouts

- Bladder instillations and washouts are discouraged because the NICE systematic review found good evidence that they do not prevent urinary tract infections, and there is concern that they may have local toxic effects [[NICE, 2003](#)].

Not using prophylactic antibiotics or antiseptics

- The recommendation not to use prophylactic antibiotics when changing catheters is based on findings from two studies in the NICE systematic review that reported that not using antibiotic prophylaxis did not increase the risk of urinary tract infection [[NICE, 2003](#)].
- The recommendation not to use prophylactic antibiotics when changing catheters in men with a heart valve lesion, septal defect, patent ductus, or prosthetic valve is based on the NICE clinical guideline on prophylaxis for infective endocarditis, which found this not to be cost-effective [[NICE, 2008](#)]. However, some experts still recommend antibiotic cover.
- The recommendation not to use topical antiseptics or antibiotics applied to the catheter, urethra, or meatus is based on findings from six clinical studies that compared meatal cleansing with a variety of antiseptic/antimicrobial agents or soap and water; use of antiseptics and antimicrobial agents did not reduce the rate of bacteriuria [[NICE, 2003](#)].

Urinary tract infection (lower) - men - Management

Prescribing information

Important aspects of prescribing information relevant to primary healthcare are covered in this section specifically for the drugs recommended in this CKS topic. For further information on contraindications, cautions, drug interactions, and adverse effects, see the electronic Medicines Compendium (eMC) (<http://emc.medicines.org.uk>), or the British National Formulary (BNF) (www.bnf.org).

Trimethoprim

What are the contraindications for trimethoprim?

- Avoid using trimethoprim in men with blood dyscrasias.

Basis for recommendation

- Because of its potential anti-folate effect, there have been reports that trimethoprim causes blood disorder. Consequently, trimethoprim is contraindicated in people with dyscrasias [[Actavis, 2007](#); [BNF 57, 2009](#)].

What are the precautions with trimethoprim?

Trimethoprim should be prescribed with caution in the following conditions:

- **Severe renal impairment**
 - As the drug is predominantly excreted by the kidney, dose adjustment may be required.

[[Actavis, 2007](#); [BNF 57, 2009](#)]

What adverse effects are associated with trimethoprim?

- Trimethoprim is generally well tolerated.
- Nausea, vomiting, pruritus, and skin rashes have occasionally been reported. These are generally mild and reversible when trimethoprim is withdrawn.
- Severe adverse drug reactions with trimethoprim are rare.

[[Aronson, 2006](#); [Actavis, 2007](#)]

What drug interactions should I be aware of with trimethoprim?

The following drug interactions have been reported with trimethoprim, when it is combined:

- **With phenytoin**

- There is a small risk of phenytoin toxicity (particularly if the serum phenytoin levels are at the top end of the range) as trimethoprim can decrease the clearance of phenytoin [[Baxter, 2008](#)]. Signs of phenytoin toxicity include blurred vision, nystagmus, ataxia, or drowsiness.

- **With ciclosporin**

- Increased nephrotoxicity has been reported. However, this interaction has not been firmly established.

[[Baxter, 2008](#); [BNF 57, 2009](#)]

Nitrofurantoin

What are the contraindications for nitrofurantoin?

- Avoid prescribing nitrofurantoin for people with:

- Creatinine clearance less than 60 mL per minute, or elevated serum creatinine [[Goldshield Pharmaceuticals, 2007](#)].

- Confirmed deficiency of glucose-6-phosphate dehydrogenase — as it may cause haemolysis.

- This is found in 10% of black people and a variable percentage of ethnic groups of Mediterranean, near Eastern, and Asian origin. It is rare in white people.

- Discontinue nitrofurantoin if there is any sign of haemolysis (which ceases when the drug is withdrawn).

- **Peripheral neuropathy**

- Nitrofurantoin should be used with caution in people with anaemia, diabetes mellitus, electrolyte imbalance, debilitating conditions, or vitamin B (particularly folate) deficiency since these conditions may enhance the occurrence of peripheral neuropathy.

- The manufacturer of nitrofurantoin advises stopping the drug at the first signs of neural involvement (paraesthesiae).

- **If the person develops unexplained pulmonary, hepatotoxic, haematological, or neurologic syndromes**, discontinue treatment with nitrofurantoin.

[[Goldshield Pharmaceuticals, 2002a](#); [Goldshield Pharmaceuticals, 2002b](#); [Goldshield Pharmaceuticals, 2007](#)]

What adverse effects are associated with nitrofurantoin?

Adverse effects associated with nitrofurantoin

- **Pulmonary:** nitrofurantoin-associated pulmonary reactions are reported in less than 1% of people treated with nitrofurantoin. Common manifestations are dry cough, chest pain, dyspnoea, and hypoxemia. Skin rash, arthralgia, and elevated liver enzymes are occasionally present. Chest imaging shows patchy infiltrates and fibrosis. Treatment includes stopping the medication and prescribing a course of corticosteroids [[Vahid and Wildemore, 2006](#)].
- **Gastrointestinal:** nausea and anorexia have been reported. Vomiting, abdominal pain, and diarrhoea are less common gastrointestinal reactions.
- **Peripheral neuropathy** (including optical neuritis), with symptoms of sensory as well as motor involvement, has been reported infrequently.
 - Stop treatment at the first sign of neurological involvement.

What drug interactions should I be aware of with nitrofurantoin?

- The use of alkalinizing agents (such as potassium citrate) should be avoided in people taking nitrofurantoin. The antibacterial activity of nitrofurantoin is reduced when the pH of the urine is increased [[SIGN, 2006](#)].
- Although the manufacturer of nitrofurantoin advises against concomitant administration of magnesium trisilicate with nitrofurantoin (due to reduced absorption), the clinical significance is uncertain as only one very small study in six people has reported this effect [[Baxter, 2008](#)].