Urinary Tract Infections in Adults

Prescribing information: these guidelines do not include all the prescribing information for all the drugs. Please refer to the BNF or consult a pharmacist for appropriate use in specific populations, for example, hepatic impairment, renal impairment, pregnancy, and breastfeeding.
Self-care: treatments marked as [OTC] are available to buy from pharmacies. Patients can be advised to purchase them as self-care where appropriate.
Guidelines about COVID-19: use COVID-specific guidance issued by NICE during the COVID pandemic.

Lower urinary tract infection

Non-pregnant women with uncomplicated lower UTI

See UTI diagnosis section for further information

Consider a back-up antibiotic prescription (to use if symptoms do not start to improve within 48 hours or worsen at any time). 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
- preferences of the woman for antibiotic use.

Note regarding risk of resistance

A lower risk of resistance may be more likely if trimethoprim has not been used in the past 3 months, previous urine culture suggests susceptibility (but this was not used), and in younger people in areas where local epidemiology data suggest resistance is low. A higher risk of resistance may be more likely with recent use and in older people in residential facilities.

NICE UTI (lower) 3-page visual summary [4]

TARGET UTI leaflet

Last updated: Aug 2021

First line: nitrofurantoin 100 mg MR BD for 3 days (if eGFR ≥ 45 ml/minute)

or
trimethoprim 200 mg BD for 3 days. (if there is low risk of resistance – see left column)

Second choice: nitrofurantoin 100 mg MR BD for 3 days (if eGFR ≥ 45 ml/minute and if not used first line)

or
fosfomycin 3 g single dose sachet

or
pivmecillinam 400 mg STAT then 200 mg TDS for a total of 3 days

Only if there is trimethoprim resistance and a liquid formulation is required:
cefalexin 500 mg TDS for 3 days.

Non-pregnant women with complicated lower UTI

See UTI diagnosis section for further information

UTI may be complicated due to an abnormal genitourinary tract or impaired host defences:

- Stent or splint (urethral, ureteral, renal) or nephrostomy.
- Post-void residual urine of > 100 ml.
- An obstructive uropathy of any aetiology (upper and lower urinary tracts), e.g., bladder outlet obstruction (including neurogenic urinary bladder), stones and tumour.
- Vesicoureteric reflux or other functional abnormalities.
- Urinary tract modifications/deviation, such as an ileal loop or pouch.
- Chemical or radiation injuries of the uroepithelium.
- Peri- and postoperative UTI, including renal transplantation.
- Poorly controlled diabetes.
- Immunosuppression.

NICE UTI (lower) 3-page visual summary [4]

TARGET UTI leaflet

Last updated: Aug 2021

First line: cefalexin 500 mg TDS 7 days.

Second choice: co-amoxiclav 500/125 mg TDS for 7 days (with culture results and susceptibility ONLY)

or

trimethoprim 200 mg BD for 14 days (with culture results and susceptibility ONLY)

or

ciprofloxacin 500 mg BD 7 days (see MHRA alert on restricted use of fluoroquinolones).

Pregnant women with symptomatic lower UTI

See UTI diagnosis section for further information

Send urine for culture and review antibiotic choice with results; change antibiotic if bacteria are resistant regardless of treatment response.

NICE UTI (lower) 3-page visual summary [4]

TARGET UTI leaflet

Last updated: Aug 2021

First line: * nitrofurantoin 100 mg MR BD for 7 days (if eGFR ≥ 45 ml/minute; avoid at term)

Second choice: amoxicillin 500 mg TDS for 7 days (with culture results and susceptibility ONLY)

or

cefalexin 500 mg TDS for 7 days (if eGFR < 45 ml/min and non-severe penicillin allergy)

* May cause neonatal haemolysis. Avoid from 37 weeks of pregnancy.

If the first line and second choice antibiotics are inappropriate contact microbiology for advice.

Pregnant women with asymptomatic bacteriuria

See UTI diagnosis section for further information Screen for bacteriuria. Confirm clearance of infection 7 days after completing treatment and request a follow-up MSU at each antenatal clinic appointment. NICE UTI (lower) 3-page visual summary [4] Last reviewed: Aug 2021	**Based on culture results and susceptible bacteria** * nitrofurantoin 100 mg MR BD for 7 days (if eGFR ≥ 45 ml/minute; avoid at term) **or** amoxicillin 500 mg TDS for 7 days **or** cefalexin 500 mg TDS for 7 days (non-severe penicillin allergy) * May cause neonatal haemolysis. Avoid from 37 weeks of pregnancy.

Adult men with lower UTI

See UTI diagnosis section for further information Send MSU for culture and susceptibility testing. Consider urology referral to screen out an underlying cause. Consider alternative diagnoses including pyelonephritis or acute prostatitis if not responded to first choice antibiotic. NICE UTI (lower) 3-page visual summary [4] Last reviewed: Aug 2021	**First line**: nitrofurantoin 100 mg MR BD for 7 days (if eGFR ≥ 45 ml/minute) **or** trimethoprim 200 mg BD for 7 days (if there is low risk of resistance – see lower UTI for further information). **Alternative with culture results and susceptibility**: pivmecillinam 400 mg STAT then 200 mg TDS for a total of 7 days **or** cefalexin 500 mg TDS for 7 days (non-severe penicillin allergy)

Pyelonephritis (upper urinary tract), acute

See UTI diagnosis section for further information Refer to hospital patients with severe systemic infection. Consider referring those who are: dehydrated or unable to take oral fluids; pregnant; at risk of complicated UTI. NICE pyelonephritis 3-page visual summary Last updated: Aug 2021	**First line**: cefalexin 500 mg TDS for 7 days **or** co-amoxiclav 500/125 mg TDS for 7 days (with culture results and susceptibility ONLY) **or** trimethoprim 200 mg BD 14 days (with culture results and susceptibility ONLY) **Second line or in severe penicillin allergy**: ciprofloxacin 500 mg BD for 7 days (see MHRA alert on restricted use of fluoroquinolones). **In pregnancy**: low threshold for hospitalisation, cefalexin 500 mg TDS for 7 days.

Prostatitis, acute

Refer severe systemic infection (any of the high-risk criteria from the NICE guideline on sepsis), or complications, such as acute urinary retention or suspected prostatic abscess, or symptoms that are not improving 48 hours after starting the antibiotic.

Review antibiotic treatment after 14 days – if no further symptoms stop treatment or continue for a further 14 days if only partially symptom free or based on history, examination findings, urine, or blood tests.

If antibiotic choices are not suitable, discuss alternative options with a local microbiologist. Ofloxacin may be preferable if a sexually transmitted infection is suspected.

NICE prostatitis 2-page visual summary

Last updated: Aug 2021

First line: ciprofloxacin 500 mg BD for 14 days then review (see MHRA alert on restricted use of fluoroquinolones).

or

ofloxacin 200 mg BD for 14 days then review.

Second choice: trimethoprim 200 mg BD for 14 days then review (with urine culture results and susceptibility ONLY)

or

co-trimoxazole 960 mg BD for 14 days then review (only after discussion with a specialist)

Catheter-associated urinary tract infection

See UTI diagnosis section for further information

Do not dipstick catheter urine.

Do not use the presence or absence of odorous or cloudy urine alone to differentiate catheter-associated asymptomatic bacteriuria from catheter associated UTI.

Do not use pyuria as an indicator for catheter associated UTI.

Refer patients with severe systemic infection to hospital. Consider referring those who are dehydrated or unable to take oral fluids, pregnant, at risk of complicated UTI, or suffering recurrent catheter associated UTIs.

Do not use prophylactic antibiotics for catheter changes unless there is a history of catheter change associated UTI or trauma.

Nitrofurantoin is not suitable and unlikely to be effective if there is clinical suspicion of upper UTI – treat with antibiotics used for pyelonephritis.

Laboratory diagnosis: intermittent self-catheterisation specimens should be labelled as "MSU".

NICE catheter-associated UTI 2-page visual summary

Last updated: Aug 2021

Supportive measures

- Check that the catheter drains correctly and is not blocked.
- If the catheter has been in place for > 7 days, consider changing it before or when starting antibiotic treatment.
- Ensure high fluid intake or when this cannot be assured perform regular bladder washout using 0.9% saline.
- Review the need for continued catheterisation.

First line if no clinical suspicion of upper UTI: nitrofurantoin 100 mg MR BD for 7 days (if eGFR ≥ 45 ml/minute)

or

trimethoprim 200 mg BD for 7 days (if there is low risk of resistance – see lower UTI for further information).

or

amoxicillin 500 mg TDS for 7 days (with culture results and susceptibility)

Second choice in patients with lower UTI only: pivmecillinam 400 mg STAT then 200 mg TDS for a total of 7 days.

Suspected upper UTI: follow antibiotic choices as pyelonephritis.

In pregnancy: cefalexin 500 mg TDS for 7 days.

Recurrent urinary tract infection in adults

In choosing an antibiotic for long-term prophylaxis consider confirmed culture and sensitivity results, co-morbidities, renal function, and contraindications.

Baseline investigations: before prescribing long-term nitrofurantoin check liver function and renal function. Advise the patient to stop taking nitrofurantoin immediately and contact their GP if there are signs of signs of pulmonary, neurological, or hepatic toxicity.

Please refer to the recurrent UTI guidance

NICE CKS (2021) Suspected recurrent UTI without haematuria in women who are not catheterized or pregnant
NICE (2018) Urinary Tract Infection (recurrent) 2-page visual summary
TARGET (2021) Urinary tract infection resource suite
MHRA (2019) Fluoroquinolone antibiotics: new restrictions and precautions for use due to very rare reports of disabling and potentially long-lasting or irreversible side effects

Last updated: June 2023

Appropriate antibiotics for long-term prophylaxis:

- Trimethoprim 100 mg at night
- Nitrofurantoin I/R 100 mg at night (if eGFR >= 45 ml/minute)
- Amoxicillin 250mg at night (only with culture results and susceptible bacteria)

Other agents may be considered after discussion with urology or microbiology.

Long-term low-dose antibiotic prophylaxis should be **tried for 3 months initially, and then reviewed with a view to stopping**.

Broad-spectrum antibiotics such as cefalexin, ciprofloxacin and co-amoxiclav have a high risk of Clostridium difficile and should not be routinely used for prophylaxis.

Ciprofloxacin should not be used for recurrent urinary tract infections because of the risk of disabling and potentially permanent side effects.

Diagnostic approach

The diagnostic approach for lower urinary tract infection (UTI) varies by patient group. Refer to specific information in the sections below: catheter associated UTI; women under 65 years (excluding pregnant women and women with a urinary catheter); women 65 years and over, all men and all people with a urinary catheter; pregnant women.

For all patient groups consider the following:

- Is the UTI **complicated** due to an abnormal genitourinary tract (i.e. congenital abnormality, previous surgery, calculus) or impaired host defences (e.g. poorly controlled diabetes, immunosuppression)?
- Are there features of **pyelonephritis** (i.e. kidney pain or tender back under the ribs, new or different myalgia, flu like illness, nausea or vomiting, shaking chills (rigors) or temperature >= 37.9 °C or < 36 °C)? If there any concerns, consider hospital admission based on clinical symptoms.
- Is there a moderate or greater **risk of sepsis** based on the presence of specific risk factors (listed in figure 1) or a National Early Warning Score of 5 or more? If there any concerns consider hospital admission based on clinical symptoms.

For the diagnosis, investigation, and management of recurrent UTI, please refer to the recurrent UTI guideline.

Urine dipstick tests

- Urine dipstick tests may be considered for non-pregnant women aged under 65 years who do not have a urinary catheter. See figure 1 for further details.
- DO NOT dipstick men of all ages and women > 65 years.
- DO NOT use dipstick in catheterised patients.
- DO NOT use dipstick in pregnant women.

See flowcharts below for further information.

When to send a urine sample for culture

- Symptomatic women under 65 unless urine dipstick negative
- Symptomatic patients over 65 years
- Pregnancy, for routine antenatal tests or if symptomatic.
- Suspected pyelonephritis and sepsis.
- Suspected UTI in men.
- Failed antibiotic treatment or persistent symptoms.
- Recurrent UTI.
- Complicated UTI.

Urine culture should be obtained before starting antibiotic treatment including during out of hours consultations.

Empirical antibiotic choice should be modified according to culture and sensitivity results as necessary.

Asymptomatic bacteriuria

Definition	Significant levels of bacteria (greater than 10^5 colony forming units/ml) in the urine with no symptoms of UTI
Epidemiology	Asymptomatic bacteriuria (ABU) occurs in an estimated 1-5% of healthy pre-menopausal females, increasing to 4-19% in otherwise healthy elderly females and men, 0.7-27% in patients with diabetes, 2-10% in pregnant women, 15-50% in institutionalised elderly patients, and in 23-89% in patients with spinal cord injuries.
Etiology	Bacteria detected in ABU are similar to those responsible uncomplicated or complicated UTIs.

Screening and treatment of ABU	Do not routinely screen for or treat ABU in women who are not pregnant, men, young people and children. Screen for and treat ABU in pregnant women as there is a risk for pyelonephritis and premature delivery. Screen for and treat ABU prior to urological procedures breaching the mucosa.
Antibiotic choice	In pregnant women with asymptomatic bacteriuria refer to the antibiotic treatment guidelines. Base on culture and susceptibility results.

Catheter-associated UTI [3]

Definition of catheter associated UTI

At least **two of the following** with no other recognised cause **or**
at least one of the following and a positive urine culture and no other recognised cause:

- fever (> 38 °C);
- suprapubic tenderness;
- altered mental status;
- malaise;
- lethargy;
- tenderness over the kidneys;
- pelvic pain;
- acute haematuria.

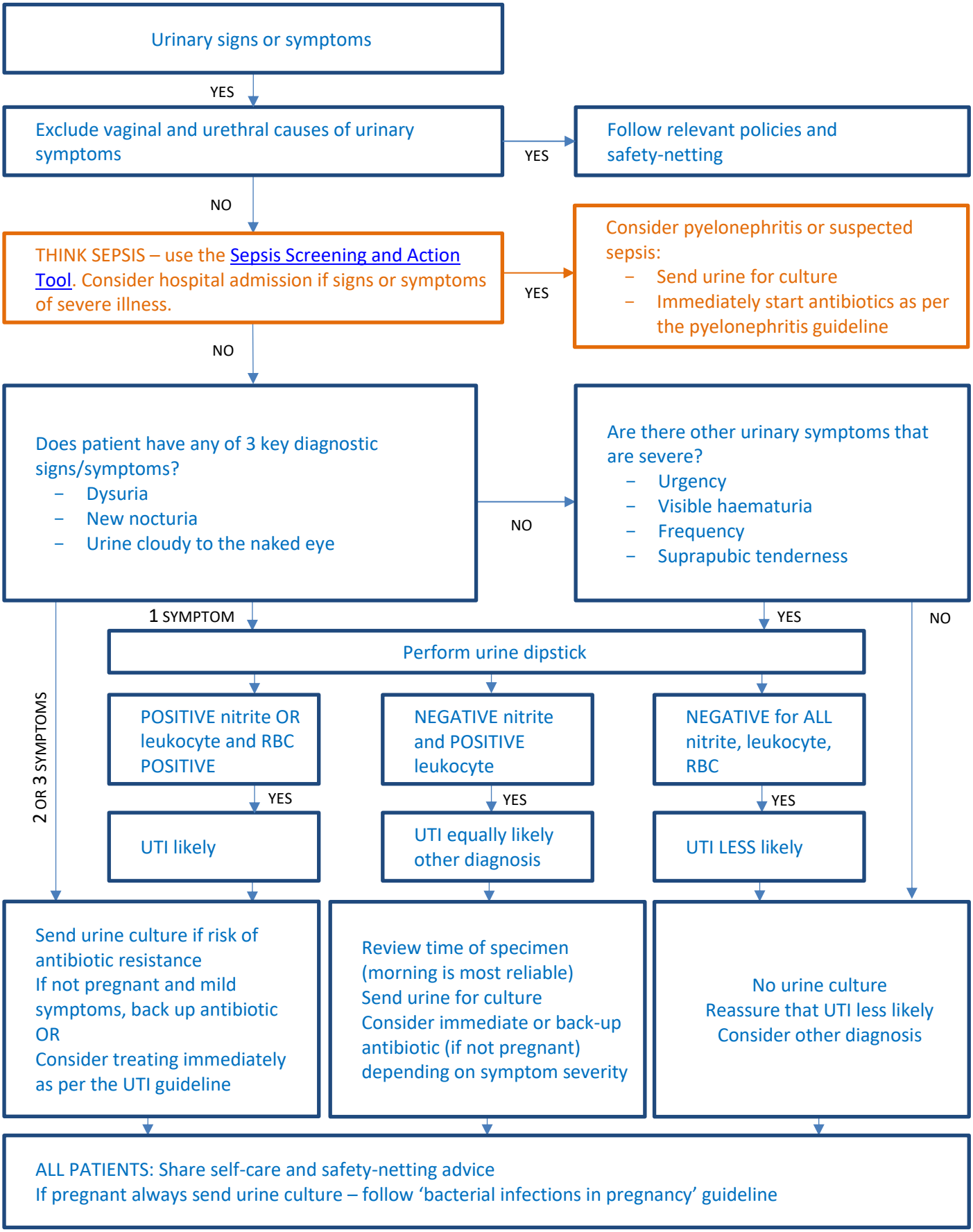
There is a high incidence of bacteriuria with long-term catheters. Antibiotics do not eliminate bacteria but leads to resistant organisms.

Send urine culture and treat only if bacteriuria is associated with systemic symptoms (e.g. pyrexia, rigor) or pyelonephritis is likely. If the catheter is retained, obtain a urine sample from the sampling port using aseptic technique. If the catheter is replaced, obtain a sample from the new catheter. If the catheter is removed, obtain a midstream urine specimen. Urine samples should be collected prior to starting antibiotics, including during out of hours consultations.

Urine dipstick testing is unhelpful in the context of an indwelling catheter and must not be performed.

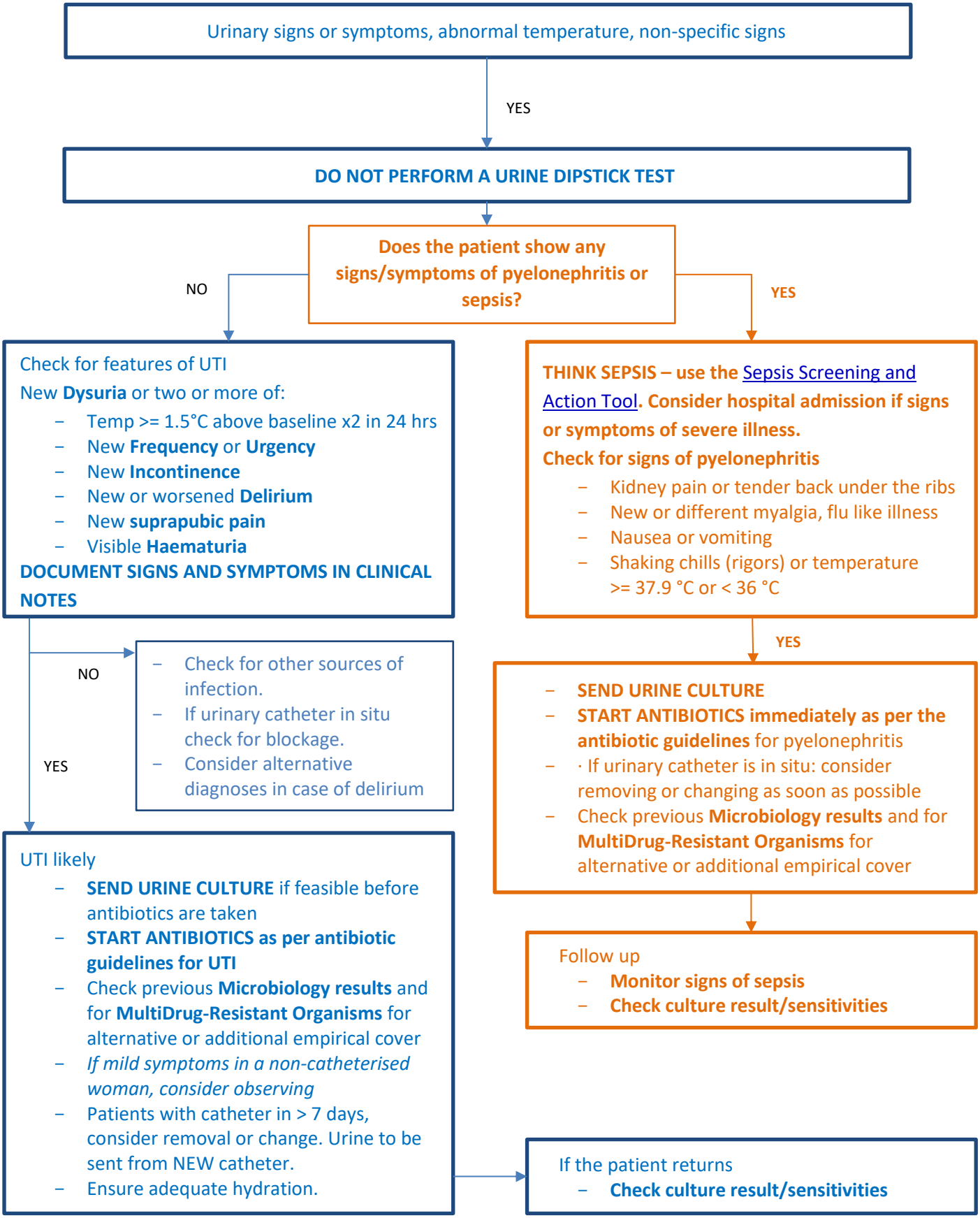
Carefully exclude other sources of infection

Figure 1. Women under 65 years excluding pregnant women and women with a urinary catheter [1]



Note The presence of the dysuria, new nocturia or cloudy urine predicts the likelihood of UTI: 71% of patients with confirmed UTI will have two or more of these features; 25% will have one; 4% will have none.

Figure 2. Women 65 years and over, all men and all people with a urinary catheter [1]



Remember: Medical Microbiology advice is available where required.
For example, resistant organisms, sepsis, and allergy issues.

Figure 3. Pregnant women

Asymptomatic pregnant woman

Screen for bacteriuria by urine culture at first antenatal visit.
Do not use dipstick test for asymptomatic screening.

↓

If positive, send repeat urine specimen for culture.

↓

If the same organism is isolated again, **treat according to antibiotic sensitivities**

↓

Repeat urine culture as test of cure 7 days after completing treatment (or at next antenatal visit) and then at all subsequent antenatal clinic appointments.

Pregnant woman with urinary symptoms
(e.g. dysuria, frequency, urgency, or other features of UTI)

Consider other causes of urinary symptoms:
- STIs including *N. gonorrhoeae*, Chlamydia, *Mycoplasma genitalium* infections
- Vaginitis e.g. Trichomonas infection
- Obstetric complications as intraamniotic infection, placental abruption
- Nephrolithiasis
- Intraabdominal infections

↓

THINK SEPSIS – use the Sepsis Screening and Action Tool**.** Any moderate risk of sepsis or National Early Warning Score overall is ≥ 5 (see Figure 1) Any new sign of pyelonephritis or systemic infection

No ↓

Send urine for culture and immediately start empirical antibiotic treatment

Yes ↓

Consider admission if upper UTI or pyelonephritis or sepsis suspected.
Send urine for culture and immediately start antibiotic for upper UTI or sepsis

↓

Advise to seek medical attention if no improvement within 48 hours or becomes systemically unwell at any time.
Re-assess antibiotic choice with urine culture results

↓

Repeat urine culture as test of cure 7 days after completing treatment and then monthly for remainder of pregnancy.

References

[1] Public Health England (2019) Diagnosis of urinary tract infections: Quick reference tool for primary care. [online] Available from https://www.gov.uk/government/publications/urinary-tract-infection-diagnosis [Accessed May 2019]

[2] NICE (2018). Urinary tract infection (lower): antimicrobial prescribing. [online] Available at https://www.nice.org.uk/guidance/ng109 [Accessed Aug 2021]

[3] NICE (2018). Urinary tract infection (catheter-associated): antimicrobial prescribing. [online] Available at https://www.nice.org.uk/guidance/ng113 [Accessed Aug 2021]

Additional Information [1]

Supportive management

- Encourage all patients with lower UTI to undertake self-care strategies including maintaining adequate hydration and using paracetamol for pain, or if preferred and suitable ibuprofen.
- There is no evidence to support the use of cranberry products to treat lower UTI.

Antibiotic management: general considerations

- In selecting the appropriate initial treatment consider the likelihood of **complicated UTI, previous antibiotic** use and risk of resistance**, and** previous urine **culture and susceptibility** results.
- Use **alternative** antibiotics (listed in descending order of preference) if there is no improvement in lower UTI symptoms after 48 hours of treatment with the **first line** agent or when the **first line** agent is not suitable.
- If an MSU is sent (See diagnosis guidance for when to consider urine sampling), review empirical antibiotic choice with the culture and susceptibility results. Change the antibiotic if bacteria are resistant and symptoms are not improving, using a narrow spectrum antibiotic wherever possible.
- Other than in pregnant women do not screen for or treat **asymptomatic bacteriuria**.
- Refer to hospital patients with moderate or greater risk of sepsis.
- Advise the patient to **seek medical attention if there is no improvement within 48 hours** of starting antibiotic treatment or if they become systemically very unwell at any time.
- **Treatment decisions should be reassessed at 48 hours** and revised empirically or in light of urine culture results if sent.

Allergy and cross sensitivity

Penicillin allergy should be evaluated carefully and in cases of not true allergy, for example, vomiting and nausea, these antibiotics can be used.

Penicillin allergy [2]

Individuals with a history of anaphylaxis, urticaria, or rash immediately after penicillin administration are at risk of immediate hypersensitivity to a penicillin; these individuals should not receive a penicillin. Patients with a history of immediate hypersensitivity to penicillins may also react to the cephalosporins and other beta-lactam antibiotics, they should not receive these antibiotics.

Patients with a history of a severe delayed hypersensitivity reaction including DRESS, Toxic epidermal necrolysis or Stevens–Johnson syndrome and Acute generalised exanthematous pustulosis (AGEP) to penicillins or beta-lactams should not receive these antibiotics.

Non-severe penicillin allergy [2]

Individuals with a history of a minor rash (i.e. non-confluent, non-pruritic rash restricted to a small area of the body) or a rash that occurs more than 72 hours after penicillin administration may be treated with other beta-lactam antibiotics, including cephalosporins, however, the possibility of a reaction should be borne in mind. See table 1 for examples of penicillin, other beta-lactam and non-beta-lactam antibiotics.

Resources and further information on allergy and antimicrobials can be found at WAAW 2021

Delayed antibiotic treatment

- In non-pregnant women with uncomplicated lower UTI and low severity symptoms, a back-up (delayed) antibiotic prescription may be used as an alternative to immediate antibiotics.
- Take account of previous urine culture and susceptibility results, previous antibiotic use and risk of resistance, and patient preference.
- In counselling patients, discuss the possible adverse effects of antibiotics (e.g. diarrhoea, nausea).

- Advise patients to use the antibiotic prescription if symptoms are not improving at 48 hours or worsen significantly at any time.
- For other patient groups, do not use delayed antibiotic treatment.

Penicillin *Contra-indicated in patients with true penicillin allergy*	**Other beta-lactam** *Avoid if undefined or serious penicillin allergy. Use with caution in non-severe penicillin allergy and no alternative therapy.*	**Non-beta-lactam** *Considered safe in penicillin allergy*
Amoxicillin Benzylpenicillin Co-amoxiclav Flucloxacillin Phenoxymethylpenicillin Pivmecillinam	Carbapenems: ertapenem, imipenem Cephalosporins: cefalexin	Clindamycin Fosfomycin Macrolides: azithromycin, clarithromycin Metronidazole Nitrofurantoin Quinolones: ciprofloxacin, ofloxacin Rifampicin Tetracyclines: doxycycline, lymecycline Trimethoprim

Table 1. Examples of penicillin, other beta-lactam, and non-beta-lactam antibiotics

Risk of antibiotic resistance [3]

For those at higher risk of antibiotic resistance, UTI should be confirmed by urine culture and trimethoprim avoided as initial empirical treatment. Higher risk of resistance is defined by the presence of one or more of the following:

- abnormalities of genitourinary tract;
- renal impairment;
- residence in a care home;
- hospital admission for more than seven days in last six months;
- recent travel to a country with increased antimicrobial resistance;
- previous UTI (within last one year) resistant to trimethoprim, cephalosporins, quinolones, or broad-spectrum antibiotics.
- recurrent UTI;
- persistence of urinary symptoms after initial antibiotic treatment.

Agent	Adult dosing	Formulations	Penicillin allergy	Renal impairment	Pregnancy	Empirical treatment	Other comments
Amoxicillin	*Treatment* 500 mg TDS	Capsules; oral suspension	✕	Dose adjust for eGFR <30 ml/min	Not known to be harmful; use throughout	No; only use if culture confirms susceptibility.	*Licensed indications:* lower UTI; pyelonephritis; asymptomatic bacteriuria in pregnancy
Cefalexin	*Treatment* 500 mg TDS *Prophylaxis* 125 mg nocte	Capsule; tablet; oral suspension	With caution in non-severe allergy	≤1.5 g/day if eGFR <40 ml/min; ≤750 mg/day if eGFR <10 ml/min	Not known to be harmful; use throughout	✓	*Licensed indications:* UTI due to susceptible bacteria; prophylaxis of recurrent UTI
Ciprofloxacin	*Treatment* 500 mg BD	Tablets; oral suspension	✓	Dose adjust for eGFR <30 ml/min	Preferably avoid	✓	*Licensed indications*: UTI including uncomplicated cystitis in women and prostatitis
Co-amoxiclav	*Treatment* 375 - 625 mg TDS	Tablets; oral suspension	✕	Dose adjust for eGFR <30 ml/min	Not known to be harmful; use throughout	✓	*Licensed indications*: UTI including pyelonephritis
Fosfomycin	*Treatment* 3 g single dose	Powder for oral solution	✓	Avoid if eGFR <10 ml/min	Limited data; only if benefits outweigh the risk	Yes; reserve for high-risk of resistance	*Licensed indications*: Acute uncomplicated UTI; complicated UTI; genito-urinary surgical prophylaxis.
Nitrofurantoin	*Treatment* 100 mg MR BD *Prophylaxis* 50-100 mg nocte	MR and immediate release tablets; oral suspension	✓	Generally, avoid if eGFR<45 ml/min; use with caution if eGFR 30-44 ml/min for ≤7 days if no other options available	May cause neonatal haemolysis; avoid during labour and delivery	✓	*Licensed indications:* acute uncomplicated UTI; severe chronic recurrent UTI; long-term suppression; genito-urinary surgical prophylaxis. In young healthy women, renal impairment is unlikely and does not need to be excluded before use. Do not use for prostatitis, suspected upper UTI or systemic infection; unlikely to reach therapeutic levels in the prostate.
Pivmecillinam	*Treatment* 400 mg STAT then 200 mg TDS	Tablet	✕	No dose adjustment required	Not known to be harmful; use throughout	✓	*Licensed indications*: Acute uncomplicated UTI Do not use for prostatitis or suspected systemic infection.
Trimethoprim	*Treatment* 200 mg MR BD *Prophylaxis* 100 mg nocte - out	Tablets; oral suspension	✓	Dose adjust for eGFR <30 ml/min	Manufacturers advise avoid; teratogenic risk in the 1st trimester (folate antagonist).	For lower UTI, only use if low risk of resistance and not used in prior 3 months*	*Licensed indications:* UTI; prophylaxis of recurrent UTI Contraindicated with methotrexate *Only use for prostatitis and upper UTI if culture confirms susceptibility.

Table 3. Key characteristics of antibiotics commonly used to treat UTI [2, 4]

Antibiotic	GFR < 30	GFR 30 - 44	GFR ≥ 45	Comments
Amoxicillin	✓(*)	✓	✓	Use only if the organism is known to be susceptible. GFR 10-30ml/min max 500mg BD GFR <10ml/min max 500mg OD
Cefalexin	✓	✓	✓	Safe in chronic renal failure. If eGFR < 10 ml/min use 500 mg BD
Co-amoxiclav	✓ (*)	✓	✓	Use 500/125 mg BD if GFR<30
Ciprofloxacin	✓ (*)	✓	✓	Use 250mg BD if GFR<30
Fosfomycin	✓ (*)	✓	✓	Avoid if eGFR < 10 ml/min
Nitrofurantoin	✕	✓ (*)	✓	Generally, avoid if eGFR<45 ml/min; use with caution if eGFR 30-44 ml/min for ≤7 days if no other options available – risk of treatment failure due to inadequate urine concentrations. Dose as in normal renal function
Pivmecillinam	✓ (*)	✓	✓	No dose adjustment is required If eGFR < 10 ml/min pivmecillinam is unlikely to be effective as it requires renal excretion into the bladder Pivmecillinam may accumulate in patients with severe renal impairment if used for extended periods of time.
Trimethoprim	✓ (*)	✓	✓	Dose as in normal renal function. Risk of hyperkalaemia when GFR<30: use with caution and only if there is no suitable alternative. A rise in Creatinine may be observed, due to competition for renal excretion.

Key

✕ Contraindicated

✓ (*) Can be prescribed in some circumstances, or with dose adjustment – see corresponding comments.

Table 4. Antibiotic choices for patients with renal impairment

References

[1] NICE (2018). Urinary tract infection (lower): antimicrobial prescribing. [online] Available at https://www.nice.org.uk/guidance/ng109 [Accessed Aug 2021]

[2] Medicines Complete (2018). BNF. [online] Available at https://www.medicinescomplete.com/#/browse/bnf [Accessed Aug 2021]

[3] Public Health England (2018). Diagnosis of urinary tract infections: quick reference guide for primary care. [online] Available at https://www.gov.uk/government/publications/urinary-tract-infection-diagnosis [Accessed Aug 2021]

[4] NICE (2018). Antimicrobial prescribing guidelines. [online] Available at https://www.nice.org.uk/about/what-we-do/our-programmes/nice-guidance/antimicrobial-prescribing-guidelines [Accessed Aug 2021]