1. Introduction and Scope
This guideline is for the microbiological diagnosis and antimicrobial management of urinary tract infections (UTI) in adult patients admitted to University Hospitals of Leicester NHS Trust (includes all ED and inpatient departments, excluding maternity assessment unit(s)).

It is to be used by clinical staff to correctly assess and diagnose patients with suspected UTI and guide the initial management of these patients by prescribers and all health professionals. Further investigation of patients especially those with recurrent infections may be needed and staff should refer to appropriate specialists.

1.1. Guideline Contents

**Diagnosis and Assessment Pathways**
- Diagnosing UTI in patients younger than 65 years old: Section 2.1, Page 2
- Diagnosing UTI in patients 65 years of age and older: Section 2.2, Page 3
- Diagnosing acute prostatitis: Section 2.4, Page 4
- Diagnosing acute epididymo-orchitis: Section 2.4, Page 5

**Empirical Treatment**
- Lower Urinary Tract Infections: Section 3.1, Page 6
- Upper Urinary Tract Infections (e.g. pyelonephritis): Section 3.2, Page 8
- Acute Prostatitis: Section 3.4, Page 9
- Acute Epididymitis and Orchitis: Section 3.5, Page 9

**Prophylaxis against recurrent Urinary Tract Infections**
- Section 4, Page 10

**General advice and information for patients**
- Section 5, Page 12

1.2. This guideline does not cover

<table>
<thead>
<tr>
<th>Condition/Situation</th>
<th>Primary Care guideline</th>
<th>Secondary Care Guideline</th>
</tr>
</thead>
</table>

1.3. Abbreviations

- MSU - mid-stream urine
- MC+S – microscopy, culture, and sensitivities
- UTI – Urinary Tract Infection
- LUTI – Lower Urinary Tract Infection
- UUTI – Upper Urinary Tract Infection
2 Diagnosis and Assessment Pathways
2.1. Diagnosing UTI in patients younger than 65 years old

- Rule out sexually transmitted infections, urethritis, vaginitis and genitourinary syndrome of menopause (vulvovaginal atrophy)

- Does the patient have a urinary catheter in situ?
  - Yes
    - Consider Signs of upper UTI:
      - Rigors
      - Flank pain
      - Signs of Lower UTI and systemic upset (pyrexia, rigors, chills, vomiting)
    - Urine dipstick is NOT needed
    - Rule out prostatitis in men (Pathway 2.3)
  - No
    - Are any of these other urinary symptoms severe?
      - Yes
        - Obtain mid-stream urine specimen and perform urine dipstick test
        - Urine dipstick is NOT needed
        - Rule out prostatitis in men (Pathway 2.3)
      - No
        - Are any of these key signs of Lower UTI present?
          - Yes - 1 sign
            - Lower UTI Likely
            - Send MSU for MC+S (morning sample most reliable)
            - Review previous microbiology and current medicines and conditions
            - Start empirical treatment
          - Yes - 2 or 3 signs
            - Lower UTI Likely
            - Send MSU for MC+S before starting treatment
            - Review previous microbiology and current medicines and conditions
            - Start empirical treatment
          - No
            - Are any of these other urinary symptoms severe?
              - Yes
                - Consider Signs of upper UTI:
                  - Rigors
                  - Flank pain
                  - Signs of Lower UTI and systemic upset (pyrexia, rigors, chills, vomiting)
                - Urine dipstick is NOT needed
                - Rule out prostatitis in men (Pathway 2.3)
              - No
                - UTI unlikely
                  - Consider other diagnoses
                  - Reassure patient and give advice on management of symptoms (section 4)

- Consider Signs of upper UTI:

- Urine dipstick is NOT needed

- Rule out prostatitis in men (Pathway 2.3)

- Upper UTI Likely
  - (e.g. Pyelonephritis)
  - Assess patient in line with UHL Sepsis guidelines
  - Send MSU for MC+S before starting treatment
  - Take blood cultures before starting treatment
  - Review previous microbiology and current medicines and conditions
  - Start empirical treatment
2.2. Diagnosing UTI in patients 65 years of age and older

- Rule out sexually transmitted infections, urethritis, vaginitis and genitourinary syndrome of menopause (vulvovaginal atrophy)

Does the patient have a urinary catheter in situ?

- Yes
  - Consider changing OR remove if possible
  - Do NOT dip or sample from catheters in situ for more than 7 days
  - Send MSU or urine from new catheter for culture if needed

- No
  - Assess for signs of urinary tract infection
    - New onset dysuria alone, or 2 or more of the following:
      - New frequency or urgency
      - New incontinence
      - New or worsening delirium/debility
      - New suprapubic pain
      - Visible haematuria
      - Temperature 1.5°C above patient’s normal twice in the last 12 hours
  - UTI Unlikely
    - Urine dipstick is NOT needed
  - If UTI is NOT likely
    - Investigate for alternative diagnoses
      - Rule out upper urinary tract infection
      - Consider other infections including respiratory, abdominal, and skin and skin-structure
      - Consider sepsis
      - Rule out other non-infective conditions
      - Check for other causes of delirium (e.g. using PINCH ME)
    - Manage symptoms
    - Do NOT give antibiotics unless evidence of sepsis. Follow UHL sepsis pathway

Consider Signs of upper UTI:
- Rigors
- Flank pain
- Signs of Lower UTI and systemic upset (pyrexia, rigors, chills, vomiting)
- Rule out prostatitis in men (Pathway 2.3)

If lower UTI Likely
- Assess patient in line with UHL Sepsis guidelines
  - Send MSU for MC+S before starting treatment
  - Review previous microbiology and current medicines and conditions
  - Start empirical treatment

If upper UTI Likely (e.g. pyelonephritis)
- Assess patient in line with UHL Sepsis guidelines
  - Send MSU and blood cultures for MC+S before starting treatment
  - Review previous microbiology and current medicines and conditions
  - Start empirical treatment

If indwelling for more than 7 days
- Consider changing OR remove if possible
- Do NOT dip or sample from catheters in situ for more than 7 days
- Send MSU or urine from new catheter for culture if needed

If indwelling catheter for more than 7 days
- Consider changing OR remove if possible
- Do NOT dip or sample from catheters in situ for more than 7 days
- Send MSU or urine from new catheter for culture if needed

Assess patient in line with UHL Sepsis guidelines
- Send MSU for MC+S before starting treatment
- Review previous microbiology and current medicines and conditions
- Start empirical treatment
2.3. Diagnosing acute prostatitis

Possible causes include
- Bacteria from urinary tract
  - Progression of UTI
  - Medical procedures such as prostate biopsy
  - Complication of catheterisation

Signs and symptoms include
- UTI symptoms
- Lower back pain
- Penile pain
- Perineal or rectal pain
- Urinary retention

Examination of the prostate may reveal the gland is:
- Swollen and smooth
- Tense
- Tender
- Warm

Consider other sources of infection or non-infective causes for presentation.

If Prostatitis likely
If patient is unwell, follow the UHL sepsis pathway

Obtain blood cultures and MSU or CSU for MC+S. Do not perform dipstick.

Do NOT perform prostatic massage.

Check previous microbiology and antibiotic history

Commence empirical treatment

Refer to urology for advice on imaging, intervention and follow-up.
2.4. Diagnosing acute epididymo-orchitis

**Signs and symptoms include**
- Pain and swelling of testes
- Pain and swelling of epididymis
- Pyrexia
- Sometimes urethral discharge

**Consider other sources of infection or non-infective causes for presentation including testicular torsion.**

**When taking a history**
- Sexual contact may implicate STIs as a cause of epididymo-orchitis
- No sexual contact or recent catheterisations suggests urological pathogen as the cause

**Sexual Contact**
If patient is unwell, follow the UHL sepsis pathway
Do not perform dipstick.
Send first 10 mL of urine for Chlamydia nucleic acid amplification test (NAAT).
Also send MSU for MC+S.
Use urethral swab if there is any visible discharge from the urethra. Send for Gonococcal culture and sensitivities.
Check previous microbiology and antibiotic history
Commence empirical treatment.
Refer to GUM for advice on testing, interventions and follow-up.

**No Sexual Contact**
If patient is unwell, follow the UHL sepsis pathway
Send MSU for MC+S. Do not perform dipstick.
Send blood cultures.
Check previous microbiology and antibiotic history
Commence empirical treatment.

If not immunised against mumps then consider mumps orchitis.
If concerned, send a viral cheek/throat swab for mumps PCR.
3 Empirical Treatment

3.1. Treatment of Lower Urinary Tract Infections

Follow diagnostic pathway 2.1 or 2.2 depending on age
Follow this pathway for prescribing choices for lower UTI
This section also covers antimicrobial treatment of urinary catheter associated lower UTI

Dipstick tests taken without symptoms or evidence of UTI should NOT be acted upon

<table>
<thead>
<tr>
<th>Non-pregnant women with lower urinary tract infections</th>
<th>All men, and women who are pregnant or have urological abnormalities, diabetes or immunosuppression with lower urinary tract infections</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consider delaying prescribing</strong>&lt;br&gt;If patient not unwell and urine has been sent for culture&lt;br&gt;• Manage symptoms (see section 4)&lt;br&gt;• Organise for review of cultures and prescribing of antibiotics if needed, based on sensitivities&lt;br&gt;• If patient is ambulatory consider delayed prescription if patient is able to get this dispensed at a later date.</td>
<td><strong>Give immediate treatment</strong>&lt;br&gt;If patient is unwell or has severe symptoms&lt;br&gt;• Advise patient on managing symptoms (see section 4)&lt;br&gt;• Organise for review of culture results when available (usually within 48 hours).&lt;br&gt;• Advise urgent medical attention if there is deterioration at any time, or symptoms do not improve within 48 hours of treatment</td>
</tr>
</tbody>
</table>

**Oral treatment for lower UTI in NON-PREGNANT WOMEN and MEN**

<table>
<thead>
<tr>
<th>First line Treatment</th>
<th>Second line treatment in those for whom nitrofurantoin is not suitable (eGFR below 45 mL/min, allergy, or treated with nitrofurantoin within the last month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrofurantoin modified release 100 mg twice daily&lt;br&gt;• For 3 days in non-pregnant women&lt;br&gt;• For 7 days in men, and women who have urological abnormalities, diabetes or immunosuppression&lt;br&gt;• For 7 days in men and women with urinary catheter associated lower UTI.</td>
<td><strong>Trimethoprim</strong> 200 mg twice daily&lt;br&gt;• For 3 days in non-pregnant women&lt;br&gt;• For 7 days in men, and women who have urological abnormalities, diabetes or immunosuppression&lt;br&gt;• For 7 days in men and women with urinary catheter associated lower UTI.&lt;br&gt;&lt;br&gt;<strong>Fosfomycin</strong> 3g oral sachet&lt;br&gt;• Single STAT dose for non-pregnant women&lt;br&gt;• STAT dose, followed by a second dose 48 hours later, for men, and women who have urological abnormalities, diabetes or immunosuppression&lt;br&gt;• STAT dose, followed by a second dose 48 hours later, for men and women with urinary catheter associated lower UTI.&lt;br&gt;&lt;br&gt;<strong>Pivmecillinam</strong> 400 mg STAT then 200 mg three times a day&lt;br&gt;• For 3 days in non-pregnant women&lt;br&gt;• For 7 days in men or women who have urological abnormalities, diabetes or immunosuppression&lt;br&gt;• For 7 days in men and women with urinary catheter associated lower UTI.&lt;br&gt;&lt;br&gt;<em>Not suitable for patients with penicillin allergy, oesophageal strictures or inability to swallow tablets whole.</em></td>
</tr>
</tbody>
</table>

*Most effective taken in the evening on an empty stomach, after emptying the bladder.*
### Oral treatment for lower UTI in PREGNANT WOMEN

<table>
<thead>
<tr>
<th>First line Treatment</th>
<th>Second line treatment in those for whom nitrofurantoin is not suitable (eGFR below 45 mL/min, allergy, or treated with nitrofurantoin within the last month, or at term)</th>
</tr>
</thead>
</table>
| Nitrofurantoin modified release 100 mg twice daily for 7 days | Cefalexin 500 mg twice a day for 7 days  
Not suitable for patients with severe penicillin allergy. |
| Avoid at term (36 weeks) or risk of preterm labour, as may precipitate neonatal haemolysis | Fosfomycin 3g oral sachet as a STAT dose, followed by a second dose 48 hours later.  
Most effective taken in the evening on an empty stomach, after emptying the bladder.  
Not suitable for those with a history of trimethoprim resistant UTI or received trimethoprim in last 3 months. |
| | Trimethoprim 200 mg twice daily for 7 days  
Discuss with obstetrics before prescribing.  
Avoid in first trimester or known low folate. |}

### Initial parenteral treatment for lower UTI in those who are too unwell or unable to take oral therapy.

Patients with lower UTI should otherwise be given oral therapy.

<table>
<thead>
<tr>
<th>First line Treatment in men and non-pregnant women</th>
<th>First line Treatment in pregnant women</th>
</tr>
</thead>
</table>
| IV co-amoxiclav 1.2 g every eight hours  
- Review within 48-72 hours and switch to oral as soon as possible  
- Maximum duration 3 days in non-pregnant women, or 7 days in men, and women who have urological abnormalities, diabetes or immunosuppression | IV cefuroxime 750 mg every eight hours  
- Review within 48-72 hours and switch to oral as soon as possible  
- Maximum duration of 7 days |
| | |
| | Second line treatment in those with penicillin allergy (all patients)  
IV Gentamicin prescribed in line with the Trust policy  
- Review within 48-72 hours and switch to oral as soon as possible  
- Maximum duration 3 days in non-pregnant women, or 7 days in men, and women who are pregnant or have urological abnormalities, diabetes or immunosuppression |

### Review Patients and Antimicrobial Therapy Daily

- Review cultures and sensitivities and change treatment if resistant to empirical therapy
- If on IV therapy: If clinically improving and able to take medicines enterally, change to oral therapy choice given above
- If not clinically improving within 48-72 hours: Review diagnosis and discuss options with microbiology
3.2. Treatment of Upper Urinary Tract Infections: e.g. Pyelonephritis (see 3.3 and 3.4 for other upper tract infections in men)

Follow diagnostic pathway 2.1 or 2.2 depending on age
Follow this pathway for prescribing choices for pyelonephritis
This section also covers antimicrobial treatment of urinary catheter associated pyelonephritis
If treating prostatitis or epididymo-orchitis see sections 3.3 and 3.4

Dipstick tests taken without symptoms or evidence of UTI should NOT be acted upon

<table>
<thead>
<tr>
<th>Initial treatment for pyelonephritis in NON-PREGNANT patients</th>
<th>Oral Therapy</th>
<th>Intravenous Antibiotics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First line</strong></td>
<td>Co-amoxiclav 625 mg three times a day for 10 days</td>
<td>Co-amoxiclav IV 1.2 g three times a day</td>
</tr>
<tr>
<td><strong>Second line</strong></td>
<td>Ciprofloxacin 500 mg twice daily for 7 days</td>
<td>Ciprofloxacin IV 400 mg twice daily</td>
</tr>
<tr>
<td><strong>Alternative</strong></td>
<td>Only use if cultures show sensitivities to this agent</td>
<td>Trimethoprim 200 mg twice daily for 14 days</td>
</tr>
<tr>
<td></td>
<td>Caution in those at risk of tendon damage and aortic aneurysm and dissection</td>
<td>Caution in those at risk of tendon damage and aortic aneurysm and dissection</td>
</tr>
<tr>
<td></td>
<td>Co-amoxiclav IV 1.2 g three times a day</td>
<td>IV gentamicin as per Trust prescribing protocol</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initial treatment for pyelonephritis in PREGNANT WOMEN</th>
<th>Oral Therapy</th>
<th>Intravenous Antibiotics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First line</strong></td>
<td>Cefalexin 500 mg twice daily for 10 days</td>
<td>Cefuroxime IV 750 mg three times a day</td>
</tr>
<tr>
<td><strong>Second line</strong></td>
<td>Ciprofloxacin 500 mg twice daily for 7 days</td>
<td>IV gentamicin prescribed as per Trust policy</td>
</tr>
<tr>
<td><strong>Alternative</strong></td>
<td>Only use if cultures show sensitivity to this agent.</td>
<td>Discuss with microbiology for advice</td>
</tr>
<tr>
<td></td>
<td>Trimethoprim 200 mg twice daily for 14 days.</td>
<td>Avoid in first trimester and known folate deficiency. Discuss with obstetrics before prescribing.</td>
</tr>
<tr>
<td></td>
<td>Caution in those at risk of tendon damage and aortic aneurysm and dissection</td>
<td></td>
</tr>
</tbody>
</table>

Review Patients and Antimicrobial Therapy Daily
- Review cultures and sensitivities and change treatment if resistant to empirical therapy
- If on IV therapy: If clinically improving and able to take medicines enterally, change to oral therapy choice given above
- If not clinically improving within 48-72 hours: Review diagnosis, consider STAT dose of gentamicin, and discuss options with microbiology
### 3.3. Treatment of Acute Prostatitis

Follow pathway 2.3 then see the tables below for prescribing choices.

<table>
<thead>
<tr>
<th>Treatment for all patients</th>
<th>Oral Therapy</th>
<th>Intravenous Antibiotics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First line</strong></td>
<td>Ciprofloxacin 500 mg twice daily for 14 days then review.</td>
<td>If vomiting, unable to take medicines enterally, severe illness or sepsis</td>
</tr>
<tr>
<td>Or Ofloxacin 200 mg BD for 14 days then review</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If clinically improved but symptoms still present treatment should be continued to complete 28 days’ treatment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Second line</strong></td>
<td>Trimethoprim 200 mg twice daily for 14 days then review.</td>
<td>If clinically improved but symptoms still present treatment should be continued to complete 28 days’ treatment.</td>
</tr>
<tr>
<td>If vomiting, unable to take medicines enterally, severe illness or sepsis</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Caution in those at risk of tendon damage and aortic aneurysm and dissection</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 3.4. Treatment of Acute Epididymitis and Orchitis

Follow pathway 2.4 then see the tables below for prescribing choices.

<table>
<thead>
<tr>
<th>Sexual contact</th>
<th>No Sexual Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Line</strong></td>
<td>Ofloxacin 200 mg oral BD for 14 days</td>
</tr>
<tr>
<td>Ceftriaxone 1000 mg (1 g) intramuscularly STAT AND Doxycycline 100 mg oral BD for 10 days</td>
<td>Caution in those at risk of tendon damage and aortic aneurysm and dissection</td>
</tr>
<tr>
<td>Refer patient to GUM for follow-up</td>
<td>If patient has red flag sepsis add in gentamicin IV once daily as per Trust prescribing guideline. Follow Sepsis guideline regarding supportive therapies.</td>
</tr>
<tr>
<td><strong>Second line if patient has allergy to penicillins or cephalosporins</strong></td>
<td><strong>Second line if unable to take quinolones or gentamicin</strong></td>
</tr>
<tr>
<td>Discuss treatment options with microbiology or GUM</td>
<td>Discuss treatment options with microbiology or GUM.</td>
</tr>
</tbody>
</table>
4. Prophylaxis against Recurrent Urinary Tract Infections (not catheter related)
Prophylaxis may be indicated for individuals suffering from recurrent, proven, urinary tract infections.

Diagnosing recurrent UTI
- UTIs should have been proven by urine culture
- Recurrent UTI is defined as:
  - 2 or more proven UTIs within the past 6-month period
  - 3 or more proven UTIs within the past 12-month period
- Some individuals may be able to identify triggers that precipitate their UTI. Examples are:
  - Sexual Intercourse
  - Catheter change

Refer to a specialist for follow-up and investigation in the following situations
- All men – refer to urology
- Women with recurrent upper UTI – refer to urology
- Women suffering recurrent UTI during pregnancy – refer to obstetrics

Advice to be given to all individuals with recurrent UTI
- Advice on hygiene and behavioural approaches to preventing UTI is the first line management for this group of patients - See section 5 for verbal and written information
- Advice should be given and outcome reviewed before active intervention given

<table>
<thead>
<tr>
<th>NON-Pregnant women</th>
<th>Alternative management for those who</th>
</tr>
</thead>
<tbody>
<tr>
<td>If hygiene and behaviour changes are not successful in PRE-MENOPAUSAL women.</td>
<td></td>
</tr>
<tr>
<td>Recommend the patient buy D-mannose tablets or powder, which is a widely available supplement.</td>
<td></td>
</tr>
<tr>
<td>Doses of 1g OD or 1g BD daily are used for prophylaxis (dosing on product packaging may only be for treatment of UTI).</td>
<td></td>
</tr>
<tr>
<td>Side effects: Bloating and Diarrhoea</td>
<td></td>
</tr>
<tr>
<td>Cautions: Diabetes</td>
<td></td>
</tr>
<tr>
<td>Do NOT prescribe this product as it is not a medicine and is not kept at UHL and cannot be prescribed in primary or secondary care.</td>
<td></td>
</tr>
<tr>
<td>Re-affirm hygiene and behavioural messages (section 4).</td>
<td></td>
</tr>
<tr>
<td>Ensure referred to urology for follow up.</td>
<td></td>
</tr>
<tr>
<td>If hygiene and behaviour changes are not successful in POST-MENOPAUSAL women.</td>
<td></td>
</tr>
<tr>
<td>Refer patient to a urologist before prescribing.</td>
<td></td>
</tr>
<tr>
<td>Prescribe a low-dose vaginal oestrogen:</td>
<td></td>
</tr>
<tr>
<td>1st line: Estriol 0.01% cream applied at night for 2 weeks, then twice a week thereafter</td>
<td></td>
</tr>
<tr>
<td>2nd line: Estradiol 10mg pessary one at night for 2 weeks, then one every 2 weeks thereafter.</td>
<td></td>
</tr>
<tr>
<td>Vaginal oestrogens are NOT licensed for this indication so the prescriber must discuss this with the patient before prescribing. Do NOT use oral oestrogens for prevention of UTI.</td>
<td></td>
</tr>
<tr>
<td>Re-affirm hygiene and behavioural messages (section 4).</td>
<td></td>
</tr>
<tr>
<td>Ensure referred to urology for follow up. The patient should be reviewed at least every 6-months (by GP or urology).</td>
<td></td>
</tr>
<tr>
<td>Alternative management for those who</td>
<td></td>
</tr>
<tr>
<td>Are unable to use or tolerate the options opposite, or have failed on these options.</td>
<td></td>
</tr>
<tr>
<td>UTI recurrence is frequent</td>
<td></td>
</tr>
<tr>
<td>UTI symptoms are severe or have involved the upper tract</td>
<td></td>
</tr>
<tr>
<td>Refer patient to a urologist before prescribing.</td>
<td></td>
</tr>
<tr>
<td>Recommended antibacterial prophylaxis for 6-months initially then review:</td>
<td></td>
</tr>
<tr>
<td>1st line: Nitrofurantoin 100 mg as a single dose or every night</td>
<td></td>
</tr>
<tr>
<td>2nd line: Trimethoprim 100 mg as a single dose or every night</td>
<td></td>
</tr>
<tr>
<td>Alternative: Discuss with urologist or microbiologist for advice</td>
<td></td>
</tr>
<tr>
<td>Re-affirm hygiene and behavioural messages.</td>
<td></td>
</tr>
<tr>
<td>Ensure referred to urology for follow up. The patient should be reviewed at least every 6-months (by GP or urology) to review efficacy and consider stop/break.</td>
<td></td>
</tr>
</tbody>
</table>
### Pregnant women

Give advice on preventing UTI as described in section 5

**Alternative management for those who**
- Have recurrent UTI despite hygiene and behaviour changes
- UTI recurrence is frequent
- UTI symptoms are severe or have involved the upper tract

**Refer patient to an obstetrician before prescribing.**

Recommended antibacterial prophylaxis for 6-months initially then review:
- **1st line**: Nitrofurantoin 100 mg as a single dose or every night (avoid beyond 36 weeks gestation, or risk of preterm labour)
- **2nd line**: Cefalexin 125mg as a single dose or every night
- **Alternative**: Obstetrics and microbiology to form joint decision for individual patient.

Re-affirm hygiene and behavioural messages (section 4)

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### Men

Give advice on preventing UTI as described in section 5

**Alternative management for those who**
- Have recurrent UTI despite hygiene and behaviour changes
- UTI recurrence is frequent
- UTI symptoms are severe or have involved the upper tract

**Refer patient to a urologist before prescribing.**

Recommended antibacterial prophylaxis for 6-months initially then review:
- **1st line**: Nitrofurantoin 100 mg as a single dose or every night
- **2nd line**: Trimethoprim 100 mg as a single dose or every night
- **Alternative**: Urology and microbiology to form joint decision for individual patient.

Re-affirm hygiene and behavioural messages (section 4)

**Ensure referred to urology for follow up.**
The patient should be reviewed at least every 6-months (by GP or urology) to review efficacy and consider stop/break.
5. General advice and information for patients

5.1. Self-care of lower UTI
If an antibiotic is not given immediately for UTI then the following advice should be given:

- Advise patient to seek medical attention, or use delayed antimicrobial prescription, if symptoms do not improve or worsen within 48 hours.
- Explain to patients why an antibiotic has not been given
- Simple analgesia with regular ibuprofen and/or paracetamol (ask patient if they have this at home to avoid prescribing and dispensing related costs).
- Drink enough to avoid thirst. Generally 6-8 glasses of caffeine-free, sugar-free, fluids per day.
- Patients should be given information about how to avoid UTI (see 5.2).
- Consider providing a patient information leaflet

5.2. Advice on preventing future UTIs
The following verbal advice should be provided to all patients:

- Wipe front to back after defecation
- Drinking plenty of fluids and remaining hydrated
- Not delaying urination and encourage post-coital urination
- Avoid occlusive underwear
- Take showers instead of baths and discourage douching

5.3. Providing written information
There are two leaflets written by Public Health England, and endorsed by the Royal College of Physicians, that may help reinforce the above information. These are freely available to download and print from: https://www.rcgp.org.uk/clinical-and-research/resources/toolkits/target-antibiotic-toolkit.aspx
6. Education and Training
No additional education or training is required

7. Monitoring Compliance

<table>
<thead>
<tr>
<th>What will be measured to monitor compliance</th>
<th>How will compliance be monitored</th>
<th>Monitoring Lead</th>
<th>Frequency</th>
<th>Reporting arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adherence to antimicrobial prescribing guidelines</td>
<td>Annual Trust Wide Antimicrobial prescribing audit and ad-hoc audits (e.g. CDI PII)</td>
<td>Antimicrobial Pharmacists</td>
<td>Annually</td>
<td>To specialities, CMG, and TIPAC.</td>
</tr>
</tbody>
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8. Supporting References

9. Key Words
UTI, Pyelonephritis, prostatitis, epididymitis, orchitis, epididymo-orchitis, urinary tract infection
### CONTACT AND REVIEW DETAILS

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### Details of Changes made during review: January 2019
- Reformatted as per Trust guidelines
- New diagnostic and treatment information for prostatitis and epididymo-orchitis
- New pathway for recurrent UTI and management of this
- Diagnosis and treatment updated in line with latest evidence – particularly new NICE and PHE guidance
- Antimicrobial therapy updated in line with local sensitivity data and new warnings around the use of quinolones.

### July 2019
- Changed epididymo-orchitis dose of ceftriaxone to 1000 mg as per updated BASHH guidelines for gonococcal diseases, from 500mg.
- Clarified how many weeks’ gestation “term” relates to for nitrofurantoin in pregnancy, and to avoid in immediate risk of premature delivery.
- Changed first line IV therapy for LUTI in pregnant women to cefuroxime, from co-amoxiclav
- Changed second line oral therapy for pyelonephritis in pregnant women to ciprofloxacin, from co-amoxiclav